

SHIPBUILDING AND SHIPPING RECORD

A JOURNAL OF SHIPBUILDING, MARINE ENGINEERING, DOCKS, HARBOURS AND SHIPPING

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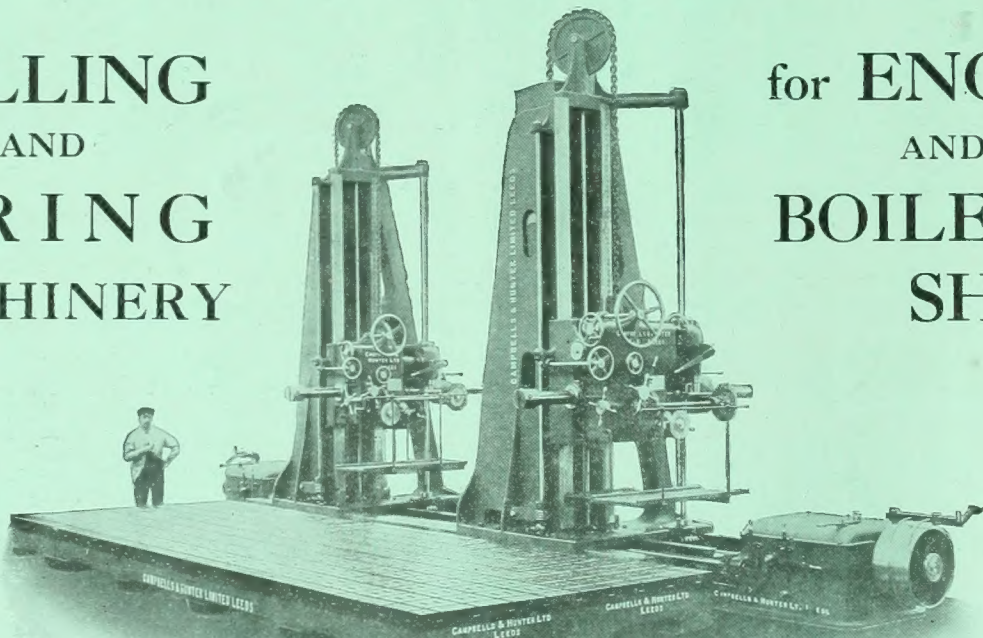
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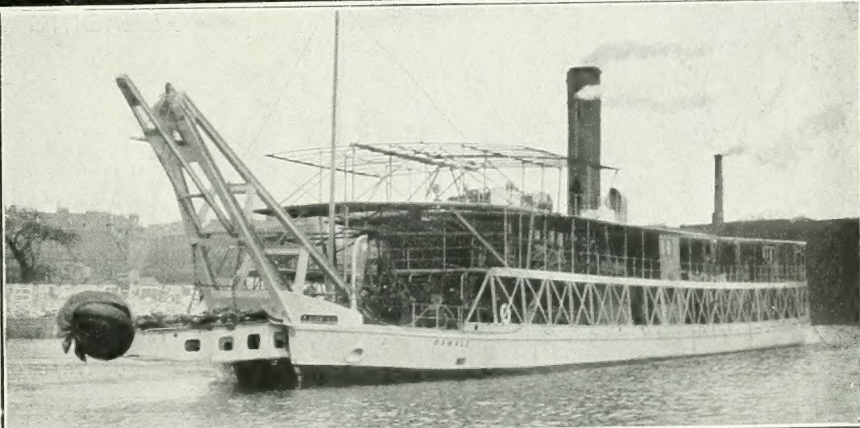
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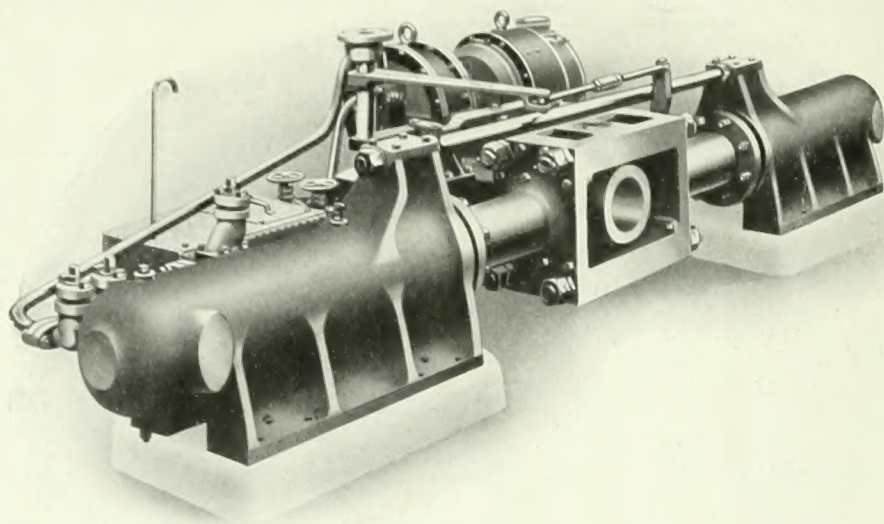
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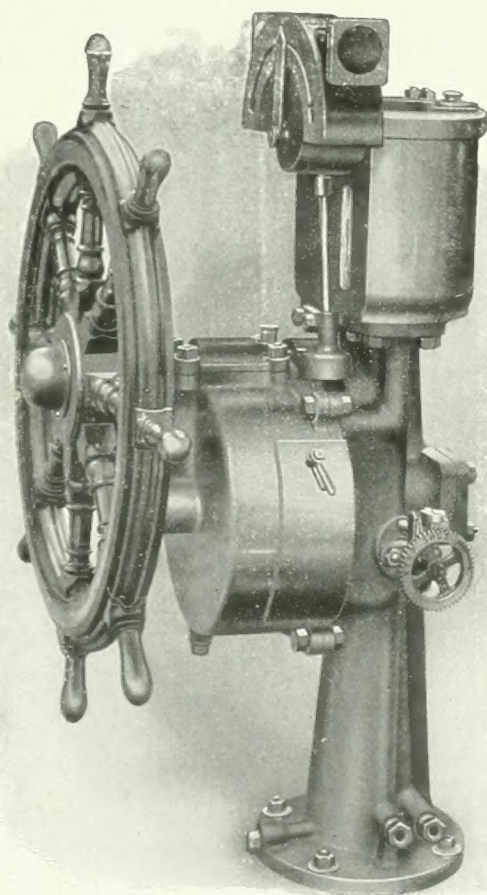
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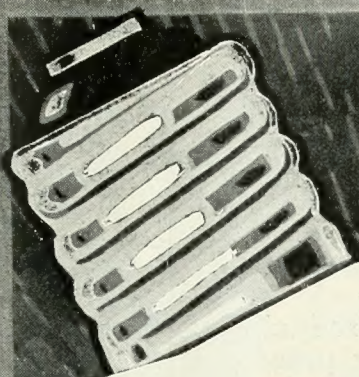
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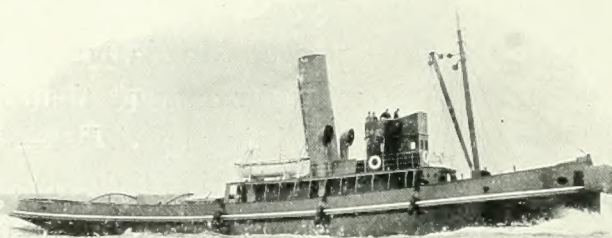
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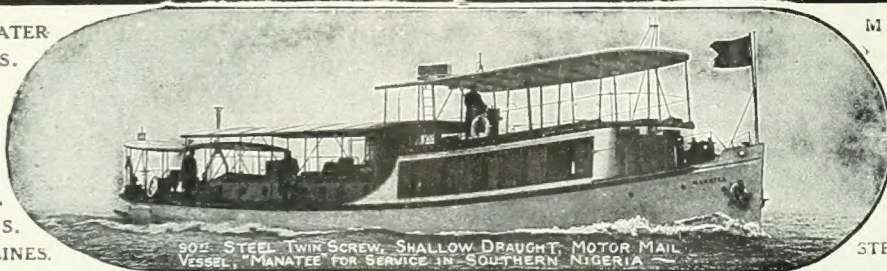
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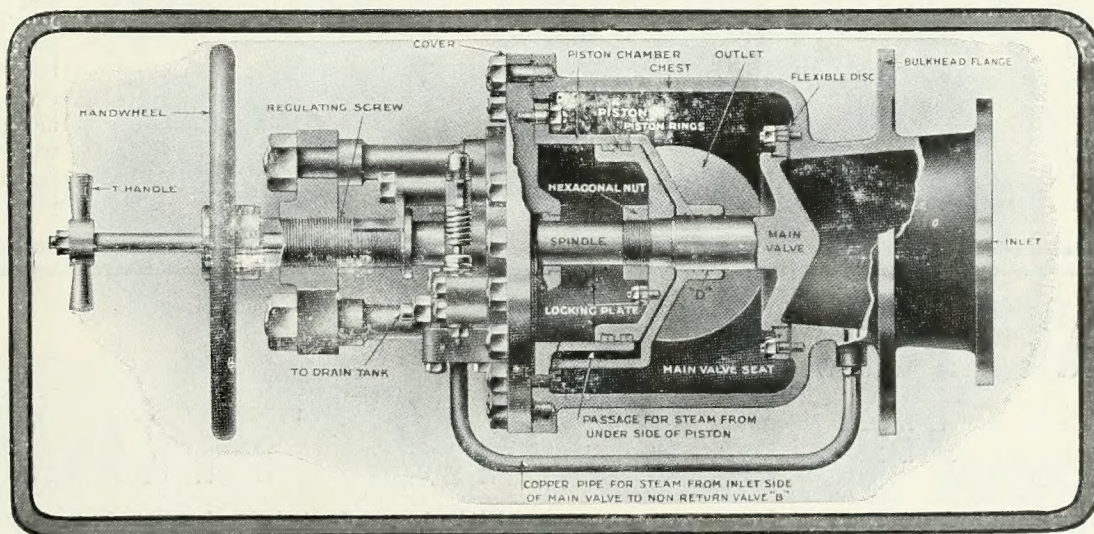
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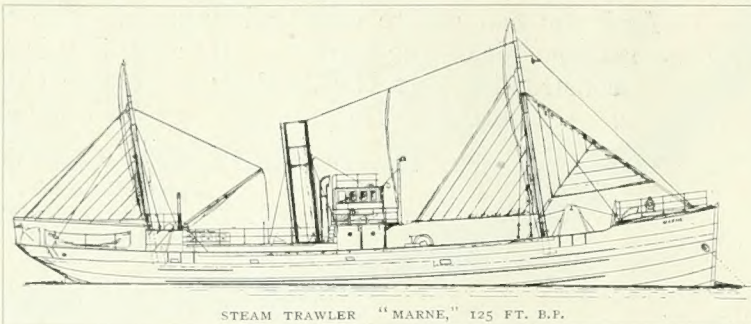
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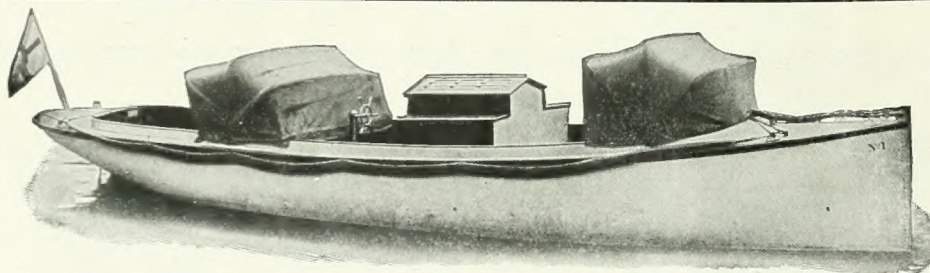
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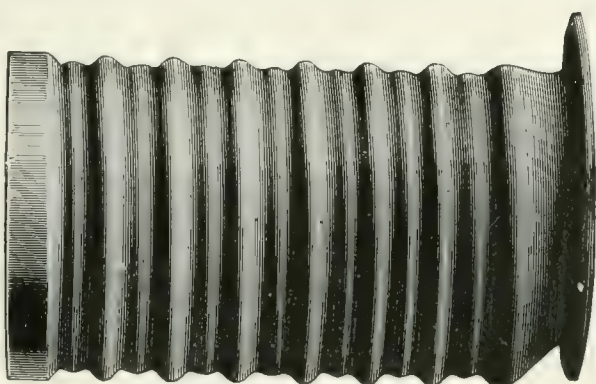
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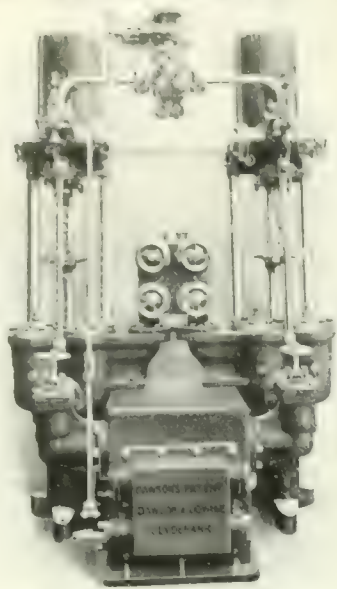
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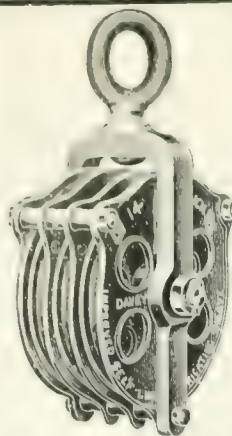
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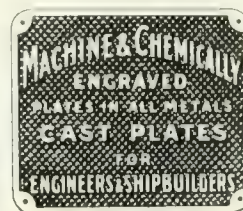
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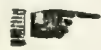
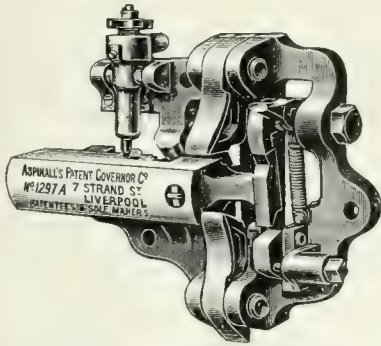
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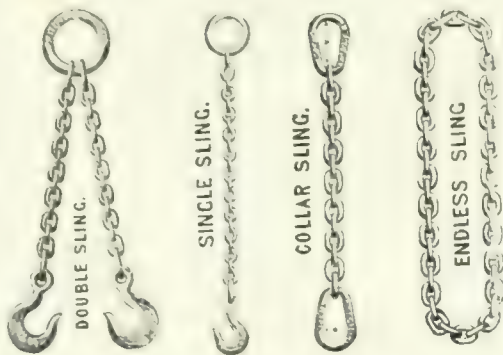
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THURSDAY, JULY 29, 1915.

No. 5.

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A MERICAN diplomacy towards Germany has been long-suffering. The third and last Note of the United States to Berlin reveals grave impatience with the truculent and ambiguous methods of German dealing, and whilst we are not in a position to speculate on what steps America may contemplate if her neutral rights are not respected, we may point out that diplomacy is not accustomed to use language of the tenor of the Note without being prepared to adopt strong action in the event of its terms not being complied with. If commanders of German naval vessels repeat acts in contravention of neutral rights, those acts must be regarded by the Government of the United States when they affect American citizens as "deliberately unfriendly." That grave warning comes at the end of a demand that the German Government will disavow the action of the commander of the submarine which sunk the *Lusitania* and of a blank refusal to entertain the suggestion that the German Government should designate certain vessels which should be allowed to pass without the attention from its under-water craft. That suggestion was as impudent as it was unprecedented. The whole attitude of the Germans since they commenced scattering floating mines in the route of commercial shipping has been in flagrant opposition to all the customs which lie behind the freedom of the open sea. They protest against what they call the navalism of Britain, but in the exercise of our sea power we have been punctiliously scrupulous regarding the rights of neutrals. What the United States now maintains for is nothing more nor less than the freedom of the open sea. The state of affairs created by the German submarines lacks all the juristic essentials of a blockade. It is pure spasmodic ruthlessness and indiscriminating barbarism. The United States bluntly tells Germany that if a belligerent cannot retaliate against an enemy without injuring the lives of neutrals as well as their property the practice should be discontinued. Herr Bethman-Hollweg may be inclined to ponder on the advice that comes to him from Washington. Admiral von Tirpitz is much more

likely to flout it, and he, it seems, is nowadays a much more powerful figure in the direction of German policy than the Imperial Chancellor.

The difference between the postal arrangements of the Republic of Panama and those operating in the Panama Canal Zone is brought home by an official intimation from the Canal authorities that considerable delay arises when letters addressed to a ship going through the Canal are sent to Colon or Panama. Letters should be addressed to the individual on board the vessel care of the Captain of the Port, Cristobal, Canal Zone, or Balboa, Canal Zone. It is important that letters should not be addressed to Colon or Panama, as then they are delivered to the postal service of the Republic of Panama. Each of the port captains' offices has developed a reliable system for the handling of ships' mail, filing it in readiness for delivery, and as soon as a vessel makes port her mail is despatched promptly. Where letters are properly addressed, as directed above, there is no trouble about their delivery.

The Clyde shipyards and engineering shops have now resumed their normal aspect of activity after the brief period of holiday.

Clyde Shipyards Holidays.

According to Admiralty instructions the men should have resumed work on Wednesday of last week, but on that day only a partial start was made at some of the yards, while at others little or no work was done till the following day. In the Glasgow district there was perhaps not more than 50 per cent. of the shipyard employees at work last week, although in a few yards the percentage was much higher. At Messrs. Denny's, Dumbarton, for instance, there was an excellent start on Wednesday morning. Messrs. Yarrow and Messrs. G. & J. Weir had also large numbers of their men at work last week. At the beginning of the present week the majority of the workers had returned to their employment, although the number of "slackers" was still too high considering the need there is for each one doing his part. The Clyde men have again come in for some pretty severe criticism for the tardy response they have made to the demands of those in authority, but no doubt some allowance must be made in view of the strenuous period of day, night and Sunday work which the men have just come through. That there is a small proportion of "slackers" among the Clyde workers no one will deny, but it is a pity that the vast majority who have given of their energy ungrudgingly to the cause of the nation should be held up to opprobrium because of the shortcomings of the few.

The Southampton Harbour Board has decided to accept an offer by the Treasury of £5,000, in respect of the loss of revenue by reason of the closing of the harbour during the second half of 1914, on condition that no payment is made by the Admiralty or the War Office for their use of the harbour. It will be seen, therefore, that the question of Admiralty liability does not arise, and the case of Southampton affords no precedent for other ports and harbours now under Government control. Moreover, it may seem that this offer is none too generous, for the Harbour Board had worked out the loss in dues alone to be £7,395, and they could point to special services rendered almost daily to the transport officials by the Harbour Master and his staff. The members, therefore, expected to receive at least a sum that would make up the loss in dues. When the Treasury's offer of £5,000 was placed before the Finance Committee the members expressed keen disappointment, and it was resolved to ask the Treasury upon what grounds they made the offer; but an intimation was received that the Lords Commissioners were unable to modify their offer and that the offer represented the difference between the net revenue of the Board

In 1914 and 1915. The members of the full Board have considered the proposed scheme and accepted it. In 1913 the Board carried a resolution to the effect that in 1914-15 1915-16 1916-17 so that the Treasury's allowance for the amount up to £19,499, or about £500 less than the surplus of 1913. It is presumed that a similar basis of compensation will be adopted in dealing with the Harbour Board in connection with the closing of the port during the present year.

When goods have been transferred by a German merchant on board a British ship, and have been transferred at sea in a *bona fide* way

Transfers of goods at sea, effected before the outbreak of the war, have been held to be valid, but the Court will scrutinise them very closely in order to ensure that the enemy has not been attracted by apprehensions that war is imminent. That in brief is the proposition of law laid down by Sir Samuel Evans in the Prize Court in the cargo case of the *South-Sea*. The goods in the part of the German seller and the neutral buyers, and the goods of the German seller, were shipped by the German merchant on board the *South-Sea* about three weeks before the declaration of war. The transactions by which the barley was transferred were completed before the end of July, 1914. If those had been undertaken with a design to defeat the rights of belligerent captors the Court would have not recognised them. Since it is not a question of a transfer of such common occurrence in commerce that it would be too harsh a rule, as Sir Samuel Evans observed, to treat such transfers as invalid unless such an element existed. On the ground that the German seller had no thought of the imminence of war between Germany and this country or of its contemplation, he accordingly held that the transfer to the Dutch merchants was valid and that the goods were not liable to confiscation. In deciding against the contentions of the Crown in such a case, our Courts again demonstrate their independence of the official attitude, and their superiority to the administrative tribunals of the Continental systems.

From time to time during the past few years there has been talk about the formation of a shipping company under the Chinese flag

Chinese Shipping Plans. with a view to the development of the foreign trade of the country, and, indeed, when the Republic was established the President announced that such a scheme was an integral part of his policy. Internal dissensions have, so far, however, prevented its realisation, but we are now given to understand on high authority that it is about to be carried out. In fact, a representative of Chinese financial interests is at present in the United States consulting shipbuilders there, the intention being to order five high-class steamers, somewhat similar in design to the latest Nippon Yusen boats. As, however, time is pressing it is proposed to charter tonnage in order to hasten the expansion of trade, particularly in view of the fact that the Japanese Government has decided that for a time all the subsidised vessels on the national register running to American ports must carry nothing but Japanese goods. The new Chinese line has been guaranteed a generous subsidy by the Government, while much of the capital has been subscribed in South and Central China, as well as along the Pacific Coast of the United States. Shanghai is to be the terminal port in China, but the service may be ultimately extended to Hong Kong and Manila. Meanwhile, negotiations are in progress for the purchase of the fleet of the Pacific Mail Steamship Company, and if these are successful presumably the syndicate will not proceed with the new construction programme. One result of this enterprise will, it is expected, be keen competition with the Japanese companies, whose vessels are already, in fact, being boycotted in the coastal trade of China. Seeing, however, that there is at present a great scarcity of tonnage in Far Eastern waters, it will probably be some time yet before shipping rivalry between the two Oriental countries comes to a head.

The deputation of city bankers and merchants which waited on the Prime Minister last week reversed the usual order of things, for they approached him to ask for taxation instead

Shipyards Workers and Income-Tax. of, as is customary, pointing out the iniquities and hardships consequent upon a Treasury imposition. One of the speakers urged a broadening of the basis of the income-tax and the Premier expressed himself as favourably inclined to the principle of commencing the incidence of the tax at a lower income. We trust that the matter of shipyard workers and employees in similar capacities will be investigated at the same time. Many of these men are now earning wages near the region of £10 a week and yet manage to evade contributing their share to the national exchequer. There are difficulties in the way of collection, but such obstacles should not be insurmountable, and the sense of responsibility in national affairs engendered by the knowledge that they would have to contribute towards national extravagance would tend to lead to better individual efficiency. Moreover, since several shipyards have received notice that as controlled establishments their profits are to be limited, it is only just and proper that the workmen should also share the common burden of contributing their quota out of any excess war profits.

The Pilotage Committee of the Humber Conservancy Board have considered a letter received from the coal exporters of Grimsby

Coal Exports and Pilotage. stating that it has been decided that no alien vessels shall be permitted to load coal at Grimsby and Pilotage. Birmingham except those of over 3,000 tons, and that vessels arriving in ballast to load coal shall wait in Grimsby Roads until the shippers obtain a licence and have the majority of their coal standing at Grimsby, and asking that the pilots may be permitted to deliver to such vessels, free of charge, the portmaster's permits for docking. A report from the commodore of the pilots read to the committee stated that they would have no objection to rendering the service named free of charge, but pointing out that it would be necessary for the portmaster or the shipowner to provide means for landing the pilot after a vessel has brought up in the roads and for taking the pilot off to a vessel when permission has been given to her to dock, and suggesting that the permit issued to any vessel should be handed in at the Board's Grimsby branch office at the same time as the order for a pilot is given. The Board, at a meeting on Thursday, confirmed the decision of the committee that as a matter of urgency the Grimsby coal exporters be informed that the Board would be pleased to comply with their request subject, however, to the conditions mentioned by the commodore, and that the coal exporters be asked to define the class of alien vessels which will be allowed to load at Immingham, whether of 3,000 tons net register, gross register or carrying capacity.

An object lesson in connection with the subject of the design and construction of cargo-carrying steamers is provided by a study

Japanese Cargo Boats. of the Japanese vessels *Toyooka Maru* and *Toyohashi Maru*, the first of which recently left the Thames, whilst the second is at the present time docked in London. Comparisons of a useful nature may be drawn between the design of the one vessel and that of the other in respect of the propelling machinery. The *Toyooka Maru* is equipped with geared turbines and a feature of the engine room equipment having a distinctive character is the provision of the Contraflo condenser system. The *Toyohashi Maru*, on the other hand, has twin-screw triple-expansion engines in which superheated steam is employed, and in this case the condensers are of the Weir "Uniflex" type. The working results of these two vessels should provide some exceedingly useful data from the machinery standpoint and, whichever system may prove in the long run to be the more generally efficient, it will not alter the fact that in both cases the methods of design and construction employed

in laying out the boats are of the most advanced character where cargo vessels are concerned. The object to be aimed at in working out a design of this class is that of obtaining a large carrying capacity, propelling machinery giving an unusually high efficiency, economy in operating costs and reliable service generally. It seems to be certain that these results will be attained and it looks as though an opportunity will soon arise for the reawakening of the controversy of some two years ago regarding geared turbines for cargo boats.

River traffic conditions in this country are so vastly different from those on the other side of the Atlantic that the average person finds difficulty in estimating the significance of the disaster on what is known as the Chicago River, whereby over 1,000 lives were lost on Saturday. The boat was one of the river boats of customary type, known as the *Eastland*.

There were then 2,408 passengers and a crew of 72 on board. It is said that the boat was overcrowded, although 500 passengers had already been removed by the officials. The *Eastland* was the first of five river boats which were to transport 7,000 persons forming the excursionists at the annual picnic of the Western Electric Company across the lake to Michigan City. The vessel had a displacement of 1,900 tons on a length of 265 ft. and a breadth of 38 ft., and the passengers were crowded on the shady side. One account has it that the vessel's ballast tanks were empty and the ship capsized as soon as the mooring ropes were cast off. The other story is that the ropes were not let go, with the result that when the boat started she was pulled over and failed to right herself. Whatever may be the cause the result is bound to focus attention on the American steamboat inspection service, which has been the subject of much criticism from time to time.

The ill-starred *Eastland* belonged to a class of ship unknown on this side. The huge American pleasure steamers, with their tiers of decks, invariably give the impression of being grievously top-heavy, but this does not of necessity give a true idea of the real stability they possess. In the meantime it must be accepted that the designers of this vessel knew their business and that they provided means for ensuring ample stability by the provision of water ballast in double bottoms. It is stated that, in order to take the large number of passengers which boarded her, the vessel had been lightened of her water ballast and had thus become unstable. If this were the case, it points to the absolute necessity of ships' officers being properly instructed in the principles of stability. Had the qualities of the ship been known to those in charge, the dreadful catastrophe could have been avoided. Several well-known shipbuilding firms give over with the vessels they construct descriptive records of the qualities of the ships. Such ought to be done in every case and the officers instructed in the proper use of these. Many vessels are liable to be made unstable by injudicious loading. In the type of steamer to which the *Eastland* belonged the stability ought to have been made sufficient, without the use of water ballast, so that no matter how the passengers crowded on to the top decks or to one side, the ship would still have been safe. This could have been accomplished by giving sufficient area to the load water line. A well-known vessel which plies on the Clyde was recently partly reconstructed because of the tender qualities it showed when passengers were embarking and disembarking. The vessel was made considerably fuller on the water-line and the "tenderness" disappeared. Accidents have happened with large liners—luckily unattended with loss of life—through the vessels heeling over suddenly when alongside harbours, owing to loose water or water in partly-filled tanks rushing to the side heeled over by the disembarking passengers. The exercise of a little caution by passengers and the possession of a little more knowledge by officers would go far to avert the repetition of such calamities.

Elsewhere in this issue we deal with the discussion on the paper entitled "Small Screw Propellers," which was read at a meeting of the Institute of Marine Engineers on Tuesday, February 2, by Mr. D. H. Jackson. In the course of the discussion reference was made by various speakers to variable or differentially pitched propellers, and one of the speakers remarked that for turbine-driven propellers running at high speeds there existed practically no evidence to favour the use of such a design. For more moderate revolutions, however, such as those which obtain in the average ship driven by reciprocating engines, there is certainly more to be said for an increasing pitch, although it has never been conclusively proved that a true pitched propeller cannot be made to give the same results as those of an increasing pitch propeller. What often happens is something like this: a true pitched propeller of a certain pitch gives indifferent results on trial, and the owners or builders decide therefore to try a propeller of increasing pitch. This propeller is made with its initial pitch equal to that of the original one and its final pitch considerably greater, and when it is found that an increase of perhaps half a knot is obtained the experiments are finished with and the reputation of increasing or varying pitch rises. The speaker remarked that he certainly did not think that the pitch should be varied from root to the tip of the blade, although he believed that this had been claimed to reduce cavitation, but such a variation is extremely likely to cause eddying and consequently inefficiency.

It is officially announced from the Panama Canal Zone that, subject to the agreement of the pilot, boiler water may be taken up in Gatun Lake, preferably between Gatun Locks and Darien. The condition of the water is said to be good. South of Darien the water is likely to be heavily charged with mud by the dredging operations in the Cut or by high waters in the Chagres River. The pilot can advise of the best place to take water. Southbound vessels of deep draught should confer with the pilot as to the advisability of taking water in Gatun Lake, as an increase in draught may affect the facility of handling the vessel past the part of the channel affected by slides. Northbound vessels which have passed through the Cut may take up all the water desired, without charge. The water in Miraflores Lake is slightly saline, as a result of infiltration from the Pacific Ocean. At present the degree of salinity is not sufficient to be distinctly injurious, but it is considered to be better to take the entirely fresh water of Gatun Lake.

Particulars of some tests made at the Engineering Experiment Station at Annapolis, U.S.A., for the purpose of ascertaining the chemical and metallographic characteristics of boiler tubes, are described in the latest issue of the "Journal of the American Society of Naval Engineers." Thirteen boiler tubes were selected at random from about 200 tubes that had to be cut out of boiler drums intended for two United States vessels. The ends of the tubes had split and about 200 out of 9,300 proved defective. The tubes after being photographed were each cut longitudinally into two pieces for metallographic examination and samples for chemical analysis were also taken. After the metallographic examination, ductility tests were made on pieces in their original condition and also on pieces heat-treated at the experiment station. The results of the chemical analysis were as follows:—

	No. of Determinations.	Average.
Carbon	2	0.566
Sulphur	1	0.029
Phosphorus	2	0.012
Manganese	1	0.592
Silicon	1	0.037

The metallographic examination showed that in most of the specimens there exists distortion of the ferrite grains and more or

SOUTH AFRICAN DEVELOPMENTS.

THE question of establishing direct services to South and East Africa by the two principal ports in the Eastern Cape—Durban and Port Elizabeth—has been under consideration by the Union-Castle Company, the Harland and Wolff, and the Clan Line, but no definite decision can be arrived at until the proposals are discussed by the Cape Steamship Conference. There is, however, every likelihood that sailings will be announced soon. The existing railway connections with these ports are excellent, and, moreover, the advisability of linking up the Rhodesian system with them is not escaping attention. If, as in all probability, this is done it will not be necessary to proceed with the construction of a line to Lobito Bay, in Portuguese territory, while, at the same time, there will be less dependence upon the Cape and Natal ports, so that the cost of transport should be considerably reduced. It is, in addition, possible that the suggested service may be extended to Hout Bay, near which there are valuable deposits of manganese ore. As a matter of fact, so far as shipping is concerned, there would appear to be a bright outlook in West, South and East Africa when the war comes to an end and the German possessions are under the British flag. In this connection, it may be usefully recalled that five years ago the German East Africa Line monopolised the trade of the east coast, and was, indeed, paid £10,000 a year by our Government for the transport of stores, as well as an additional amount for the carriage of officials. Then, as the result of strong representations by British commercial interests there, the Union-Castle Company inaugurated a service to Zanzibar, Mombasa, Beira and other ports, an itinerary which is also followed by the Clan, Harrison, and Ellerman Lines, which co-operate for the purpose. Now it is likely that German influence will be entirely eliminated from that part of the world.

GERMANY AND "WIRELESS."

IN commenting last September on the captures of German merchantmen and on the number of German ships which had managed to reach neutral harbours, we pointed out that of the 24 vessels belonging to the Hamburg-Amerika and Norddeutscher Lloyd lines that had up till then been caught, 14 were not equipped with "wireless." Of the remaining 10, two at least were too far away to reach a neutral port in time, one was sunk as a converted cruiser and another ran short of coal when trying to run the gauntlet of British cruisers. Exactly what use Germany made of wireless telegraphy in those early days of war was revealed by Mr. Godfrey Isaacs at the annual meeting of the Marconi Telegraph Company on Monday. At 5 o'clock in the afternoon of August 4, he said, Germany sent out a message to all its wireless stations, which passed that message on from one to another, and sent it out to sea, covering a radius of something like 2,000 miles or more—a message to this effect:—"War declared upon England. Make as quickly as you can for a neutral port." These stations cost the German Government £2,000,000. In the light of what had subsequently happened some might say that it was a very bad investment, but they would be mistaken. This country declared war on Germany at midnight on August 4 last, so that the message was sent out seven hours before war was declared, and by it Germany contrived to save the greater part of its mercantile marine. If it had but saved one of its big ships—the *Vaterland* or any one of that class—it would have paid for the whole cost of these wireless stations.

It did save them that, but he was afraid he could not say more at the present time. It would be recollected, he said, that the Marconi Company proposed to our Government that they should, at their own expense, build stations and work a commercial service in peace time, and in case of war hand over the whole of the stations to the Government. The events surrounding the introduction of the topic into Parliament are well within the recollection of our readers. Mr. Isaacs recalled the incidents and proceeded to point out that immediately the matter was mentioned, the German Government started to build—without any Parliamentary discussion, he took care to point out—a chain of wireless stations in all German colonies. The stations were immediately proceeded with, and they were built. The price which the German Government paid for the whole of these stations was three times the price which the Marconi Company had asked of the British Government.

MASTERS, MEN AND MUNITIONS.

IT is soon yet to be definite about either the success or the failure of the Munitions Act, because, so far, it has been possible only partially to apply it. From the first we have never hesitated in our belief that, from the point of view of employers, the legislation left a good deal to be desired. They were never consulted about its provisions. For months they endeavoured to arrange with representatives of their men for a temporary suspension of trade union restrictive rules and practices, and failed to make any headway in that direction, simply because the Government did not deem it to be politic to back their effort. When the Government did act they acted in a half-hearted sort of way by appointing the Committee on Production. Then came the Treasury Agreement, and when its ineffectiveness became clear, the further conferences with the trade unions, out of which the Munitions Act came.

In order to induce the men to agree to a temporary suspension of trade union restrictive rules and practices the Government undertook to limit, to a ridiculous extent and in a far from workmanlike way, the profits of the owners of controlled establishments. Considering what the attitude of employers had been—especially employers belonging to the Engineering and Shipbuilding Employers' Federation—the Government's solution of their munitions' difficulty did not err on the side of fairness. As, however, the employers themselves are not disposed publicly to complain about the treatment we say no more about it than that. It will generally be conceded to be a point of some importance that, although the employers are compelled to forego a part of their profits, the men are not fulfilling their part of the bargain and appear to be in no fear of any legal consequences.

It is not our opinion that the enlistment of munitions' volunteers is in a degree a failure. With 100,000 suitable men the calculated needs of the controlled establishments and the national factories can be met, and a fairly broad margin be left for civil work. As a matter of fact, the official requirement of skilled men is under 40,000. The transference of such a number of skilled men would mean, of course, the employment in addition of 240,000 semi-skilled men. The enlistment only seems to be a failure, because the voluntary scheme is not yet in working order. But although it is not really a failure, several things are happening which may have the effect of seriously impairing its efficiency, and for most of them the rank-and-file of labour are, as we say, to blame.

For example, one or two non-federated firms are understood to have declined the services of a draft or drafts of volunteers. Why have they done so? Not because there was an objection to pay the prescribed subsistence and travelling allowances, but simply because of the effect it was feared payment of the allowances would have on the other men in the shops. Another spoke in the wheel of the scheme is the objection by trade unionists to the enrolment as volunteers of non-unionists. That, it may be said, is not permissible under the Act. A good many things are,

however, being done which are not permissible under the Act, and nobody in authority seems to mind—or rather to have the courage to interfere.

Then there is unquestionably and unfortunately much direct restriction of output. As a simple matter of fact, there has been no general suspension of restrictive rules and practices. The majority of the men are doing almost as exactly as they did before the Act came into force, and the minority are slowly, but surely, being obliged to follow suit. No Labour leader admits that to be the case. All are, on the contrary, inclined when the opportunity offers publicly to characterise the allegations of slacking as slanders on the working classes. Nevertheless, they know that there is slacking, and greatly deplore it. For proof of that we need go no further than the printed appeal on the subject by the National Advisory Committee on War Output.

The circular opens with this definite statement:—"Cases of restricted output have been reported, indicating the existence of practices which in this great National crisis cannot be too strongly condemned." So that, in spite of the assertions of leaders of the men, there is slacking and the fact is well known in upper Labour circles. Moreover, the appeal leaves the reader in no doubt as to why there is slacking. "The justification for restrictive practices is," the Committee say, "usually the fear that prices will be cut if too much money is earned and that the increased output will be made the standard of production after the war. It is also feared that there will be reductions in piece prices and an increase in the amount of work demanded from time workers. Even were those fears justified," the circular goes on to say, "that would be no excuse for deliberate slacking when the need for munitions is so imperative and when upon their unrestricted and abundant supply the fate of this country depends." And so on.

The Committee hope that their appeal will not be "in vain." We hope so, too. If it is in vain the Munitions Act will, indeed, be the failure it is already said to be, and the result will not be creditable to Trade Unionism. In framing it, the Government showed absolutely no consideration to the employers; yet employers are striving everywhere to achieve its object, viz., to increase the output of munitions. The trade unions were, on the other hand, given everything they asked for, and their one concern seems to be to wreck the Act.

SMALL SCREW PROPELLERS.

IN our issue of April 22 last we commented upon a paper entitled "Small Screw Propellers," which was read at the Institute of Marine Engineers early this year by Mr. D. H. Jackson, a member of the Institute. The latest volume of transactions issued by the Institute and dated June, 1915, contains a report of the discussion on the paper, which brought out many interesting points relating to the subject of small screw propellers. One of the participants in the discussion remarked that it was generally recognised that the theory of the action of the screw propeller has yet to be formulated. It is difficult on account of the large number of factors that have to be taken into account, each of which mutually react, so that their individual effects can only be separated in a few cases of the simplest character. Probably much may be learned from the action of turbines and centrifugal pumps when thinking out the action of a propeller. The great difference that must be allowed for is that in the case of a propeller there is no assistance to be obtained from the casing in directing the flow of the water in the best way towards the screw, and to reduce the lost work to a minimum by giving the best direction to the stream leaving the propeller. These considerations have led designers to the use of guide blades and to enclose the propeller in a short tube. From the necessity to reduce loss of energy, turbine designers carefully consider the angles of entry and exit of the vanes so that the shock of entry may be reduced to a minimum, but such a result can only

be obtained for one set of conditions respecting speeds of revolution. To obtain this result in the case of a propeller is extremely difficult, because of the disturbing effects upon the stream line towards the screw by the ship's skin, whose contour and distance from the screw is probably different in every case that the designer has to consider. Another point of moment is the centrifugal effect due to rotation, whilst there is the relative value of the propulsive effect that can be obtained from the different parts of the blade, from the boss outwards to the tips of the blades. Since in any actual case all these factors co-operate in very different degrees, it is not surprising that in practice almost every marine engineer has his own ideas of what constitutes the real propeller of value. Probably with the increased attention that is now being given to the conditions governing the flow of fluids, the better conceptions regarding stream line flow, some of the propeller faddists, together with their fads, will vanish. In the meantime it is necessary to wait for the men with actual knowledge and the ability to analyse their results; it is to this class of men that we must look for progress in the enunciation of the principles of screw propeller design. The commercial value of such data is a factor that cannot be ignored.

Another speaker dealt with the point relating to true *versus* differential pitch, and for the purpose of emphasising his remarks produced a diagram showing the angle of entrance of a propeller 18 ft. 6 in. diam. and 23 ft. 6 in. pitch. This diagram shows that:—

5 ft. diameter angle of entrance	Degrees.
7	57½
9	47½
11	41½
13	35
15	30
17	27½
18½	24
19½	22½

And from this the speaker deduced the fact that the inner circle of the propeller is the most inefficient and further that differentially pitched propellers are designed on better principles than true pitched ones.

The author of the paper, in replying to the discussion, expressed the opinion that a great objection to the differentially pitched propeller mentioned by several members is that a part of each blade, where the pitch is varied from root to tip, is frequently working with negative slip. This is a most inefficient condition. Also the eddying due to different velocities at various parts of the stream delivered from the propeller is a fruitful cause of vibration and corrosion, to say nothing of the internal strains set up in the propeller blades. To his way of thinking a more promising way of dealing with the innermost portions of propeller blades is to enclose them completely in a false boss of relatively large diameter. This boss, together with the cone at the after end and the bossing of the hull for the stern tube should form a fair line and should be, if possible, a fair continuation in form of the after body of the ship.

TRADE PUBLICATIONS.

[Copies of any of the publications mentioned in this section will be sent on application to the firms by which they are issued.]

Starting Switches.—Price List No. 5111 recently issued by the British Thomson-Houston Company, Ltd., Rugby, deals with air-brake Y-delta starting switches for three-phase squirrel-cage induction motors. These have been designed for use with this type of motor up to 25 h.p. output, which are required to start up against light load only. The effect of the switch is to decrease the current at starting by lowering the voltage across the motor windings. The starting torque is at the same time reduced as the square of the reduction in voltage. The switch when in the starting position joins the windings in Y-connection and when in the running position to delta connection. Thus at starting the voltage across each phase winding is only 58 per cent. of that when running delta connected. As a result the torque is reduced to approximately one-half of the full-load torque, and the current taken from the supply mains to about one and a-half times to twice full-load current.

arranged, but again no settlement was arrived at, and it was not until Mr. Lloyd George (Minister of Munitions), Mr. W. Runciman (President of the Board of Trade), Mr. A. Henderson (Minister of Education) and a number of permanent officials went to Cardiff and, after a midnight conference, followed by a day's sitting, that terms were arranged which were ratified by the miners' delegates on Wednesday, July 21. The colliers obtained practically the whole of their demands after a stoppage lasting six days—a stoppage which is likely to leave an indelible stain on the patriotism of the Welsh collier for having put the nation in such dire peril during one of the greatest crises through which Britain has been called upon to face.

AVERAGE COAL PRICES.

The attitude of the miners was attributed to the fact that colliery owners were making fabulous profits, but when it is taken into consideration that the cost of production, which by the way was considerably reduced through large numbers of miners having enlisted, was materially increased and that exports were restricted, by the Government requirement that coal could not be transported to neutral countries except by licence, it will be recognised that the contention of the miners was more imaginary than real. As evidence of the exaggerated statements concerning the price of coal the following table, compiled by the Board of Trade, showing the average f.o.b. price of large and small coals shipped foreign at the chief South Wales ports during the first half of 1914 and 1915, is interesting:—

	LARGE COALS.							
	Cardiff.		Newport.		Swansea.		Port Talbot.	
	1914.	1915.	1914.	1915.	1914.	1915.	1914.	1915.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
January	17 7	17 7	16 3	16 8	18 0	18 3	17 3	17 4
February	17 9	18 0	16 9	17 2	18 0	18 7	16 11	18 6
March	17 9	19 4	16 9	18 6	17 8	18 10	16 6	20 0
April	17 8	22 3	16 5	19 10	16 8	19 7	17 0	21 3
May	17 10	23 2	16 7	22 3	16 2	20 11	17 1	25 1
June	17 10	22 6	16 8	20 6	16 11	19 9	16 9	24 2

	SMALL COALS.							
	Cardiff.		Newport.		Swansea.		Port Talbot.	
	1914.	1915.	1914.	1915.	1914.	1915.	1914.	1915.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
January	9 8	10 2	11 3	11 4	12 6	15 5	8 8	10 0
February	9 9	11 1	10 10	12 1	13 2	16 7	8 9	9 11
March	9 8	12 11	11 0	15 1	11 0	15 0	8 4	11 4
April	9 9	15 0	11 1	18 7	10 0	14 5	8 10	13 6
May	10 2	16 1	11 4	18 6	11 7	16 7	8 9	15 9
June	9 9	16 9	11 2	20 1	12 5	16 8	8 8	16 6

FOREIGN COAL EXPORTS.

So far as foreign exports are concerned, the official Board of Trade returns show that there were despatched from the United Kingdom in the first six months of the current year only 22,332,590 tons, compared with 34,586,938 tons in the first half of 1914, a decrease of no less than 12,254,348 tons. How each district fared is shown in the appended table, giving the coal exports to foreign and British possessions in the first half of 1914 and 1915:—

From	January 1 to June 30,		Decrease or Increase.
	1914.	1915.	
	Tons.	Tons.	
Bristol Channel	14,469,769	9,999,384	- 4,470,385
North-Western Ports	273,168	283,628	+ 10,460
North-Eastern Ports	11,617,420	6,941,283	- 4,676,137
Humber Ports	3,314,142	1,888,650	- 1,425,492
Other East Coast Ports	182,815	18,790	- 164,025
Other English Ports	60	80	+ 20
East Coast Scotland	3,701,447	1,798,780	- 1,902,667
West Coast Scotland	1,028,117	1,401,995	+ 373,878
Irish Ports	—	—	—
Totals	34,586,938	22,332,590	- 12,254,348

Even allowing that something like 6,000,000 tons of coal were shipped for the use of the allied fleets, there is still a big drop in the amount sent away, while on top of this both shipments of cargo and bunker coals coastwise from the United Kingdom have also materially declined when compared with the corresponding six months of 1914.

COLLIERY OWNERS' PROFITS.

Having outlined the effect of the war on outward freights, coal prices and coal exports, besides drawing attention to the miners' demands for increased wages on the grounds that owners were reaping large profits, it is interesting to note what the colliery proprietors have to say on the matter. According to a report of the owners' auditors, 79 Welsh colliery undertakings, with an annual output of 33,983,829 tons and employing 121,722 men, in the year ended December 31, 1914, made a total profit, after payment of interest on debenture or other loans and preference shares, of £1,712,047 5s. 3d., which works out at 1s. 0.09d. per ton. On 47.4 per cent. of the total output, a profit of less than 1s. per ton was made and 60.9 per cent. yielded a surplus of under 1s. 6d. per ton and 84.6 per cent. showed a profit of less than 2s. per ton. Only on 15.4 per cent. of the total output was there earned a profit of 2s. 6d. and over per ton on the ordinary capital, while the production of 29 of the 79 concerns was marketed either at a loss or at a profit of less than 6d. per ton. Then, again, a fact that is not generally known is that the steam coals requisitioned for naval purposes are supplied by the colliery owners at prices fixed by the Admiralty.

WELSH COAL STRIKE AND OUTWARD FREIGHTS.

Welsh colliery undertakings are not the only businesses which have suffered by the six days' strike of the South Wales miners. Loss of production has meant many thousands of pounds to the colliery owners, but the loss to shipowners—who, by the way, had nothing to do with the dispute—is also bound to be enormous, for freights from South Wales since the settlement of the dispute have dropped to levels which establish fresh low records for the current year, while the cost of keeping vessels lying idle in port awaiting cargoes must also be taken into consideration. Not only was charting at Cardiff and Swansea last week considerably below the normal, but rates, as will be noted from the following, were down to a material extent:—

	Lowest, 1914.	Lowest to June 30, 1915.	Rates prior to strike.	Rates following strike.	Decrease compared with previous lowest.
Cardiff to					
Algiers	7 fr.	19 fr.	22 fr.	17 fr.	2 fr.
Alexandria	6/10½	22/-	25/-	20/-	2/-
Bordeaux	5 fr.	13½ fr.	15 fr.	12½ fr.	1 fr.
Boulogne	4	14 6	13 6	10/-	2 6
Chantenay	5 11.	13 fr.	16½ fr.	13 fr.	—
Genoa	6	15	22/-	17 6	6
Marseilles	7 60 fr.	21 fr.	25 11.	18 fr.	3 11
Naples/Salerno/Torre Annunziata	6 6	18 6	20 6	16/-	2 6
Rouen	4 11	10 6	10 9	9 6	1/-
St. Nazaire	4 57½ fr.	12 fr.	15 fr.	11½ fr.	½ fr.
Swansea to					
Caen	4/-	10 6	12/-	10/-	- 6
Havre	3 9	10/-	11/-	10/-	—
Honfleur	1	12/-	12/-	10/-	2/-
St. Malo	3 9	9 6	10 9	9 6	—

MARSEILLES AND LE HAVRE DURING THE WAR.—According to the *Petit Parisien* imports at Marseilles have increased but exports much decreased during the war, the total turnover (imports and exports) from August, 1914, to March 31 last, being 36 per cent. less than during the corresponding months of 1913-14. The requisition of so many mercantile vessels for war purposes has affected the port very adversely. At present conditions are somewhat more favourable and, that there may be lasting improvement, it is recommended that restrictions on exports be relaxed, at least so far as concerns allied countries and neutrals where security can be obtained that goods will not be re-exported to enemies; that engineers and other skilled workers or those holding posts of responsibility be allowed to perform their normal duties, while remaining mobilised; that merchantmen be not deprived of their crews; and that free ports be provided. In Le Havre economic conditions are much better. In the early days of the war the harbour was naturally very congested, but conditions are now better, and good service has been rendered by a technical commission in securing rapid discharge of cargoes and despatch by rail. Here, also, it is desirable to leave technical men at their ordinary posts.

LLOYD'S REGISTER WRECK STATISTICS
FOR 1914.

The following summary of the statistics of the shipping losses sustained by the United Kingdom in 1914, as published by Lloyd's Register, shows that during 1914 the gross tonnage of the vessels lost was 338,000 tons, as against 276,000 tons in 1913, 112 tons exceeding all losses in any other year. Of this total, 291 vessels of 8,662 tons gross tonnage and 27,000 of 184,400 tons were sailing vessels.

These losses, as regards sailing vessels, are practically the same as those for 1913; but as regards steamers, they are nearly 338,000 tons higher than for the previous year.

The losses are chiefly accounted for by losses due to war operations. During the last five months of 1914 no less than 162 vessels of 372,277 tons were sunk by warships or by mines. Excluding war losses, the tonnage of vessels lost through wreck, breaking up, &c., during 1914, is actually lower by 34,195 tons than that lost during 1913.

The number and tonnage of vessels lost, &c., during the previous five years are as follows:—

Year.	Steamers.		Sailing Vessels.	
	No.	Tonnage.	No.	Tonnage.
1910	121	602,442	48	28,000
1911	107	619,772	41	26,000
1912	75	72,000	34	159,000
1913	371	276,000	206	184,400

Excluding war losses, one of the most common terminations of a vessel's career is by breaking up, dismantling, &c. (not in consequence of casualty). The amount of tonnage so dealt with in 1914 was 128,978 tons, this being 20,183 tons more than that for 1913. Sixteen per cent. of the steamers and 16.8 per cent. of the sailing vessels removed from the merchant fleets of the world in the course of 1914 are accounted for in this manner. Of the total tonnage of such cases, 34.3 per cent. is represented by United Kingdom vessels.

The statistical tables exhibit interesting data as to the relative frequency of the different kinds of casualty, &c., which conclude the existence of vessels. Strandings and kindred casualties which are comprised under the term "wrecked" are, apart from war losses, much the most prolific cause of disaster. To such casualties are attributable 45.7 per cent. of the losses of steamers and nearly 39 per cent. of sailing vessels. Cases of abandoned, foundered and missing vessels are no doubt frequently more or less similar in the circumstances of loss. If these be taken collectively, they form nearly 20½ per cent. of the steamers and nearly 31½ per cent. of the sailing vessels removed from the mercantile marine during 1914, owing to casualty.

The return has been prepared in such a manner as to enable a comparison to be made between the percentages of loss suffered by each of the principal merchant navies in the world. These percentages include war losses, and great as the absolute loss of vessels belonging to the United Kingdom appears to be, it is seen to form but a very moderate percentage of the mercantile marine of the country.

It may be of interest to point out that whilst the United Kingdom has lost 2.2 per cent. of the tonnage and 2.43 per cent. of the vessels owned, if all the "neutral" countries mentioned in the tables be taken together, they have lost 2.37 per cent. of the tonnage and 2.62 per cent. of the vessels owned by them.

COURT LINE ISSUE.—The directors of the Court Line are offering to shareholders 100,000 of the unissued £1 shares at 1s. premium. These shares will receive in full the final dividend or bonus as paid on the old fully-paid shares for the year 1915, but will not be entitled to participate in the interim dividend at the rate of 12 per cent. per annum already declared. An option to subscribe for a further share at 25s. up to February 28, 1916, will be given with each share of this issue allotted.

THE EROSION PROBLEM AT LIMON BAY.

The construction of the three permanent shore dykes on the south shore of Limon Bay, with the centre one about a quarter of a mile west of the centre line of the Panama Canal where it passes from the bay into the hills at Mindi, has been completed, and the construction of 25 timber groins, which shall supplement the effect of the dykes in the prevention of erosion of the shore and consequent heavy silting in the Canal channel, will be completed within a few days.

A summary of the plans for the dykes, with a *resumé* of the observations and experiments with temporary timber dykes which led to the decision to build the permanent structures, was published in *The Canal Record* of October 21, 1914, and the issue of July 7 last gives supplementary particulars. Their construction was started in the early part of November and completed on April 29.



Map showing protected portion of Limon Bay.

The general plans were carried out, with modifications, and the erection of the groins was begun after the completion of the dykes.

As completed, the three dykes are spaced 500 ft. apart, centre line to centre line, and all are built parallel to the axis of the Canal. This makes them extend due north and south and lie practically at right angles to the original shore line. The dyke nearest the Canal is 800 ft. from the centre line. This one is also the longest, being 700 ft. in length, while the centre dyke is 400 ft. long and the third one is 200 ft. in length. Each dyke is about 8 ft. wide at the top, which is approximately 2 ft. mean sea level, and the sides slope about one in one. Altogether, about 8,000 cubic yards of rock were used in their construction.

The rock was obtained from Gaillard Cut, in the slide at La Pita Point. The material was a hard rock and it was well broken up in excavation, so that most of the pieces could be handled by hand in the construction of the dyke. The rock was loaded in solid bottom barges formerly used in the Porto Bello rock service, and towed through the canal to the shore of the bay, at the site of construction. Here it was unloaded into Decanville cars, which were lifted out by a derrick and swung into the trucks, running on a narrow-gauge track on the landing wharf. The track led to the sites of the dykes and was extended as filling advanced.

The groins, which are to act as auxiliaries in protecting the shore, are heavy timber fences, built out at right angles to the shore line. Each reaches about a foot above high water and extends from

the high-water line to the low-water line. As the contour varies, their length is not constant, but the fences average about 100 ft. in length. Twenty-two of the groins were built along the shore to the westward of the dykes, on the other side from the Canal. They are spaced 400 ft. apart and reach from the dykes along the south shore of the bay and up the west shore to a low headland called Kinney's Bluff, within the lee of Limon Point. In addition to these 22 groins, two have been built in the two spaces between dykes and one has been built between the first dyke and the edge of the Canal.

As the erosive effect of currents along the south shore of the bay is greatest during the dry season, under the southward driving of

SHIP REPAIRING AT GREENOCK.

Ship repairing and overhauling has been brisk at Greenock for a considerable time past and the amount of work of this description carried on at the port is being limited only by the dry-docking facilities provided.

As several of the large dry docks at Glasgow have been placed at the disposal of the Admiralty, a good deal of work which was dealt with formerly at Glasgow has recently been transferred to Greenock, and there is every prospect that ship repairing will in future become a much more important industry on the lower reaches of the Clyde than it has been in the past. This



Utilising a Dry Dock to Advantage at Greenock.

the trade wind, and the dykes and groins have been completed only since the close of the last dry season, they have not been subjected to a complete test. Their usefulness, however, was made apparent by the experimental timber dykes, and already the shore line, instead of continuing to recede, as heretofore, has been advancing slightly. This is due to the dropping of silt in suspension when the currents are arrested by the dykes and groins, and deflected back to the northward. In the original state, the currents swung to the eastward and deposited a great deal of silt in the Canal channel.

DANUBE SHIPPING AND THE WAR.—Shipping traffic commenced in March and on those sections left open by the war has been exceptionally important this year. Some of the usually most important stretches are closed and corn from Roumania and goods transport from Germany and Austria to the Balkan States have been suspended. According to the *Hamburger Nachrichten*, various official measures have restricted and delayed Austro-Hungarian grain traffic in the Danube, but goods traffic, particularly from Vienna to Budapest, is favourable, as also is German traffic via Regensburg.

probability is recognised by the Harbour Trustees, who contemplate a scheme for the improvement and enlargement of the dry-docking facilities of the port.

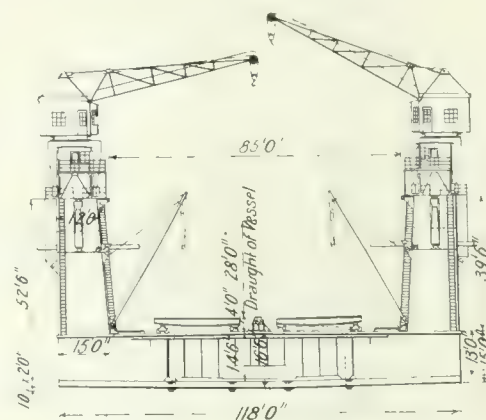
Our illustration above shows the method adopted of utilising to the best advantage one of the dry docks at Greenock. The blocks are occupied by three vessels—two tugs and a small coasting vessel—all of which are being repaired by Messrs. James Lamont & Co.

At the head of the dock is Messrs. Steel & Bennie's tug *Vanguard*, which was rather badly smashed by collision with a steamer on the Clyde. Messrs. Lamont are fitting the vessel with new paddle-boxes, new paddle-wheels and new bridge and funnel, and they are also giving the vessel a thorough overhaul. In the centre of the basin is the small coasting vessel *Countess of Mayo*, belonging to Messrs. MacBrayne & Co., Glasgow. This boat was damaged by being ashore on the west coast of Scotland. The other vessel in the basin is the Clyde Shipping Company's tug *Flying Condor*, which came into contact with another vessel in James Watt Dock, Greenock, and sank in the dock. Twelve plates under the water-line have to be renewed.

THE VULCAN FLOATING DOCK.

The Vulcan Company, of Stettin or, to give their complete title, Stettiner Maschinenbau A.G. "Vulcan" have at their new shipbuilding yard on the northern bank of the Island of Ross, Hamburg, four floating docks for the repair of merchant and naval ships. One of these is 433 ft. long and 70 ft. wide, to take ships of 6,000 tons displacement. A second has a length of 508 ft. 6 in. and a clear width of 84 ft., to take ships of 10,000 tons displacement. A third dock—an illustrated description of which appeared in the April 4, 1913, issue of *Shipbuilding and Shipping Record*—has a length of 722 ft., an overall breadth of 140 ft. 9 in. and a clear width of 108 ft. 3 in. It was designed to lift a vessel displacing 35,000 tons and of a maximum draught of 32 ft. 9 in.

A fourth dock was, just before the war, introduced into service, and this, like the others, was designed by Messrs. Clark & Standfield, of Westminster. This new dock, 605 ft. 3 in. long, inside, and 85 ft. clear beam, is capable of lifting in 90 minutes, from the time of touching the keel blocks, a vessel displacing 17,500 tons and of a maximum draught of 28 ft. over the blocks. The dock is in two sections,

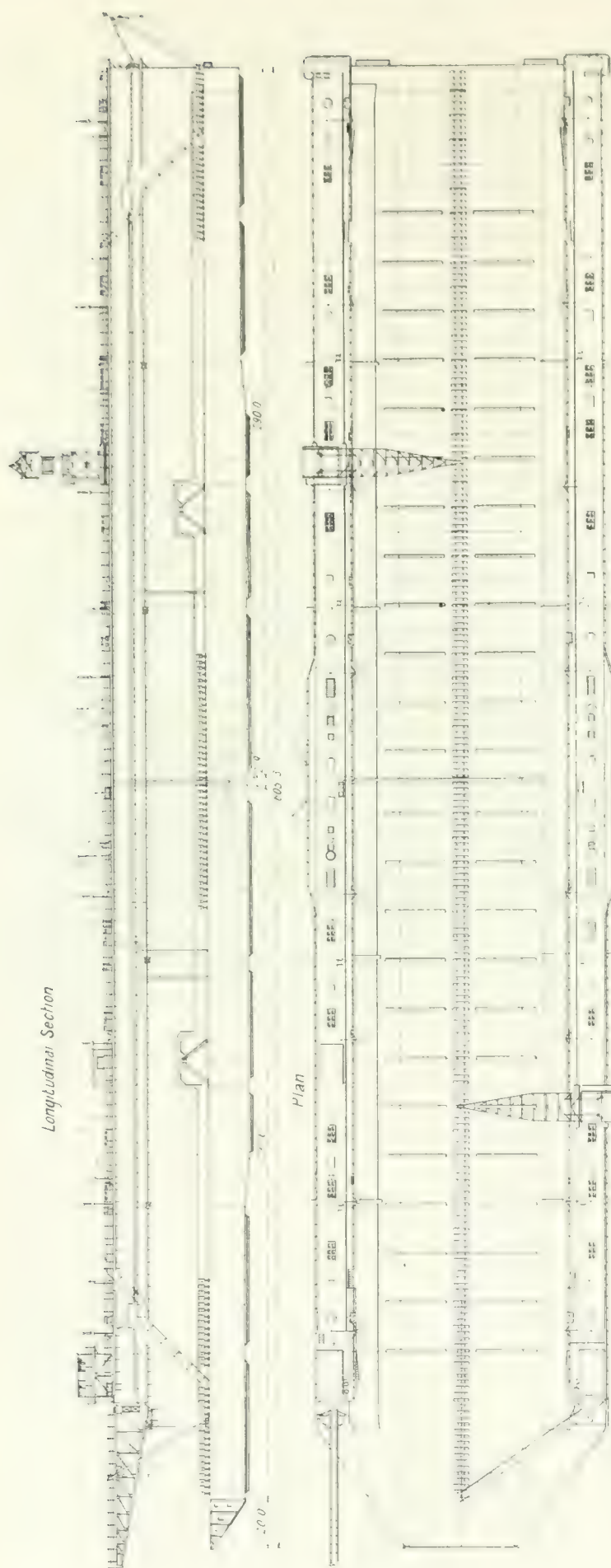


Floating Dock, End Elevation.

which is somewhat unusual, but each of these sections may be lifted by the 10,000-ton off-shore dock at Hamburg, so that there was no need to make it self-docking.

It will be seen from the plan that there is an unusually large number of bilge blocks, but these were fitted at the express wish of the owners. The design of these is different from the ordinary type, being, in fact, a modification of the beam type of bilge-shore used on off-shore docks. In each case the bilge-shore proper consists of a steel or timber beam hinged at the end nearest the centre line of the dock and provided with means of raising and supporting the outer end. The off-shore type is worked by a steel rack actuated by a worm and pinion, passing down through a tube in the pontoon. This, in cold situations like Hamburg, has the disadvantage of getting blocked with ice and is somewhat troublesome to thaw out. In the present dock, the outer end of the shore rests upon a strong steel carriage with four wheels at the bottom, running on the pontoon deck, and two wheels at the top, upon which rests the steel beam. This carriage can be run in or out by means of

Longitudinal Section and Plan of the Vulcan Company's 35,000-Ton Floating Dock.



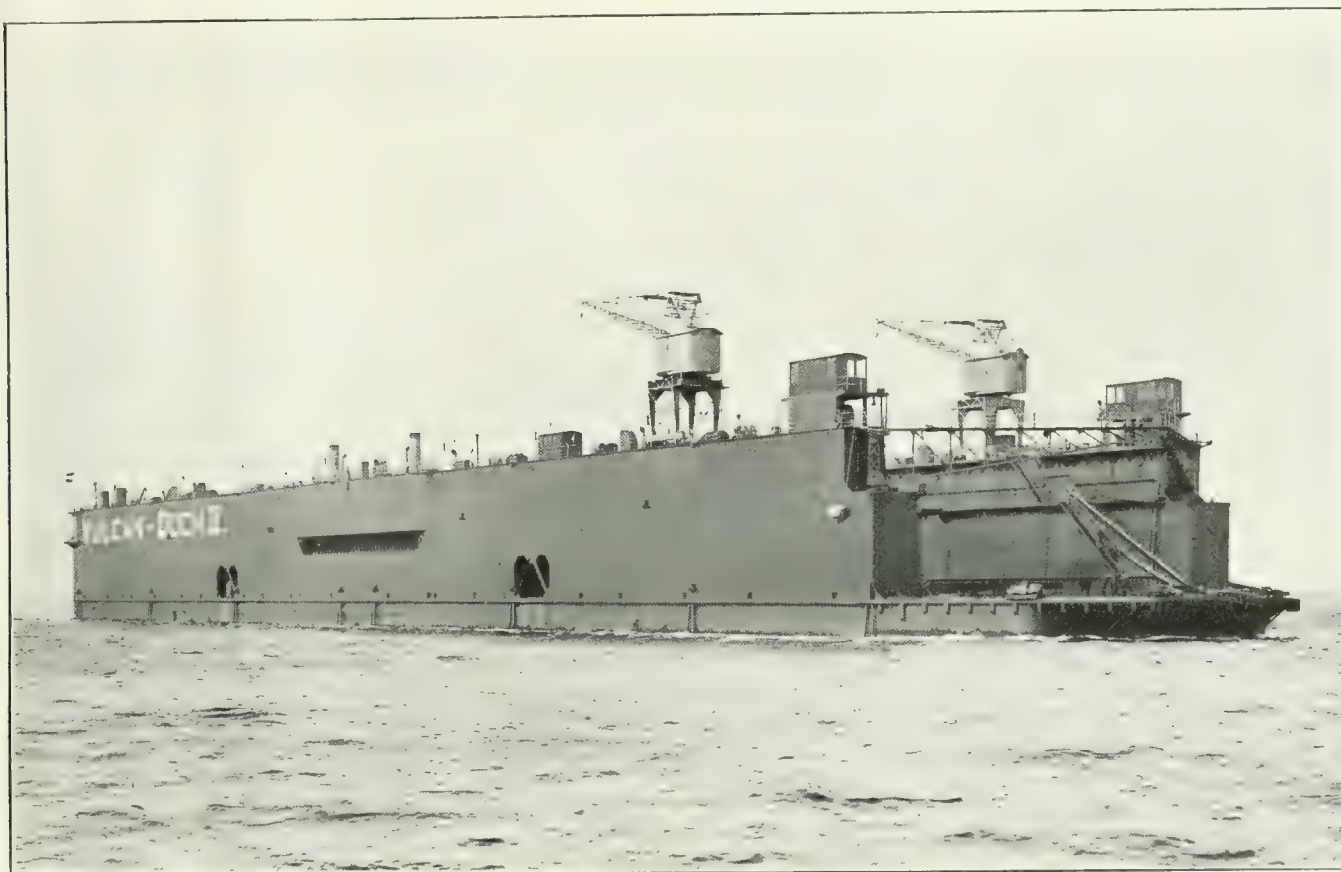
a chain passing over a pitch wheel worked by an electro-motor. The range of action of these shores is considerable, so that no special blocking is required whatever be the shape of the ship to be dealt with. The lower portion of each keel-block is of steel, the upper being timber, as usual. This does not give quite the same cushioning effect as with timber alone, but has the advantage of making the keel-blocks easily movable, so that they may be concentrated in the neighbourhood of the heel of the vessel with a very long overhang, or it enables them to be easily moved out of the way in the event of repairs being required to the keel.

Propellers are handled by means of steel derrick poles worked by the capstans of the dock. Another interesting feature in the design of the dock is that it is pointed at one end and square at the other. This was done to enable it to be moored at right angles to the quay, and to afford easy access to the same, the pointed

GERMAN SUBMARINES.

At a recent meeting of the Société des Ingénieurs Civils, H. Laubeuf, the well-known submarine expert, gave some interesting particulars relating to German submarines. At the beginning of 1914, Germany had 24 completed submarines and 14 under construction. Of the latter, 8 were completed when war was declared, but the remaining 6 (U 33 to U 38 inclusive) commenced in 1913 were still building. Including 5 Austrian and 1 Norwegian submarines, requisitioned whilst in course of completion at the Krupp-Germania yards, Kiel, Germany had at her disposal 38 submarines early last August.

Germany was a latecomer in the field of submarine construction, her first vessel, U 1, being launched in August, 1905, and placed in service 18 months later. Naturally, she has been able to benefit



Vulcan Floating Dock, No. 4.

end being, of course, away from the shore. The moorings are carried under the dock, so that they may run no risk of being fouled by passing craft. In this latest addition to their equipment, the utilisation of mechanical stokers for the boilers was decided upon in order to minimise labour costs. We believe this is the first instance wherein use has been made of mechanical stokers on a floating dock. Generally speaking, it is not considered expedient to lay out this extra capital required for a set of boilers which are in use only for a few hours weekly. The dock was built by the Flensburger Schiffbau Gesellschaft.

GOODS FOR SWITZERLAND.—The Board of Trade are in receipt, through the Foreign Office, of copy of a despatch from His Majesty's Ambassador at Paris reporting that the French authorities strongly advise that all goods destined to be sent from the United Kingdom through France to Switzerland should be shipped to the port of C'ette, as the French ports on the North Sea, Channel, and Atlantic Ocean, as also Marseilles, are congested.

largely by the experience of others. U 1 to U 12 resembled the French *Aigrette* class and the next eight, larger vessels, resembled the *Pluviose*, whilst German eminence in Diesel-engine design and construction has been a powerful factor in evolving the speedy craft now so misapplied in the so-called submarine "blockade."

In spite of intense activity in construction and large credit votes (£1,000,000 in 1913), Germany has not yet realised her programme, which was to have 72 submarines completed by 1917 at latest. According to the above data and allowing for losses, she cannot have more than half this number available, but there are probably in use a number of small submarines built in sections and transported overland, whilst reports indicate that every endeavour is being made to build as many new submersibles as possible. According to M. Laubeuf, French submarines of given age and displacement have better navigating characteristics and more powerful armament than German craft.

EXPLOSION OF A SEA-WATER HEATER.

A report of the Board of Trade Inspector under the Boiler Explosions Act into the circumstances attending the explosion of a sea-water heater on board the *ss. B. Lee* has recently been published. The vessel is engaged in passenger and cargo traffic and trades regularly between Liverpool and Boston. It has a gross tonnage of 8,041 tons and is equipped with engines of the triple expansion type, single screw, and having cylinders 32, 54 and 90 in. diam. by 66 in. stroke. Steam is generated at a pressure of 196 lb. per sq. in. in two double-ended and two single-ended boilers. Two heaters were provided, one for sea water and the other for fresh water, both of these being apparently similar in every detail. They were situated within the funnel casing on the port and starboard sides respectively. The tops of the heaters were about 2 ft. below the top of the casing. Steam for heating the coils was taken from the auxiliary range at full boiler pressure and, owing to the liability

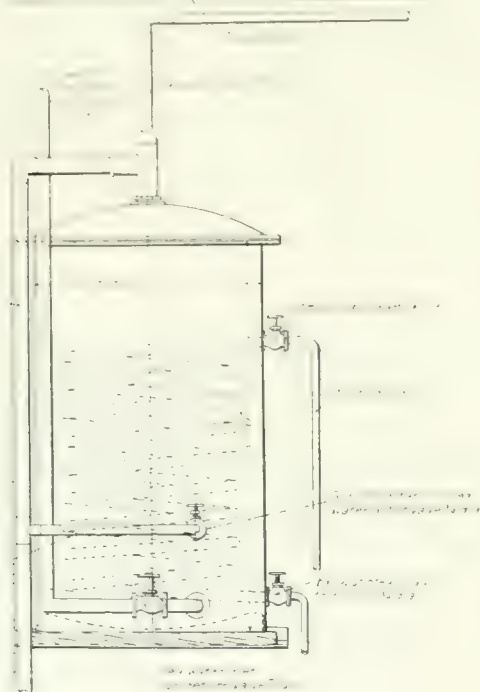
The explosion occurred at about 3 p.m. on November 28 last, when the vessel was about 105 miles west of the Fastnets, on a voyage from Liverpool to Boston.

This sea-water heater was made about 14 years ago by a firm of copper-smiths which is now defunct, and this method of heating the sea water for the baths has now been discarded, and a system of geysers installed. The steam piping for the fresh water heater has now been altered so that steam is taken from the low pressure side of a reducing valve which is set for a pressure of 50 lb. per sq. in. Hand holes are to be cut in the shell to enable the heater to be cleaned out as required, although danger arising from an accumulation of scale is in this case not so likely to occur.

The Engineer-Surveyor in Chief added the following statement to the report:—The small diameter and tortuous passage of the escape pipe would, no doubt, under certain conditions, permit of a much greater pressure arising within the heater than was expected to obtain.

BLYTH HARBOUR IMPROVEMENTS.

Despite the war and the consequential shortage of contractors' labour and the difficulties and delays in obtaining deliveries of material, very fair progress is being made with the scheme of improvements to the Blyth Harbour, authorised some two and a half years ago. These works comprise the establishment of new staiths in the upper harbour to provide two coaling berths for ships up to 10,000 tons. The staith jetty will be about 1,570 ft. in length, and there will be a depth alongside of 30 ft. at low water and 45 ft. at high water. The substructure is being constructed of greenheart and the piling of the same has now been brought out to a distance of 1,300 ft. from the land. A tidal basin of 15 acres is being dredged at the site of the new staiths, and this work involves the removal of more than 1,500,000 tons of material, and already two-thirds of this tidal basin has been completed to a depth of 24 ft. at low water. At the outer end of the new staiths or turning basin, 9 acres, is being formed almost entirely out of the solid rock, and when this work is completed there will be here a depth of 24 ft. at low water. The substructure of the staiths is being executed on behalf of the Blyth Harbour Commission, whilst the superstructure will be carried out by the North-Eastern Railway Company, the whole being of timber work. Whilst shipping coal on the gravitation principle, these new staiths will also be equipped with modern anti-breakage appliances worked electrically and capable of coaling the highest ship's bunkers. Good progress is being made in the re-construction and extension of the west pier at Blyth, which is being carried out in greenheart timber and is of the open type and made up of main piling carrying a top platform and of sheet piles enclosing rubble filling. The pier is about 350 ft. west of the old west pier and will be parallel to the latter for a considerable distance. Three projecting arms, or groynes, are to be provided towards the end of the pier for the purpose of forming wave traps. By their recent Parliamentary Bill the Blyth Harbour Commissioners obtained powers for the construction of a bridge with approaches thereto, to form an improved means of communication between the districts on both sides of the river and also provide better navigation facilities in the upper harbour. This bridge will consist of steel girders carried on timber piles, but a definite commencement with this work will not be made until the termination of the war. Similarly, a proposed extension of the east pier by the construction of a monolithic concrete pier, 1,120 ft. in length, extending in a southerly direction from a point adjacent to the present east pier lighthouse is deferred. This pier is to be founded upon rack and its base will consist of concrete sack blocks, each of about 100 tons weight, and built up to a level of 3 to 4 ft. above low water. Upon the sack block foundation a monolith of concrete will be raised, as mass work within timber casing, to a height of 7 ft. above high water level and it will be surmounted by a decking carried on open framing of reinforced concrete.



Sea Water Heater which Exploded.

of the heater to prime the steam inlet valve was not allowed to be open more than just off the face. The outlet valve was always full open. The chief engineer stated that the chief trouble with the sea water heater was the corrosion of the iron service and vapour pipes and the choking of the outlet pipes by scale. In order to remedy this as much as possible an attempt was made to clean the heater, but owing to the impracticability of removing the coils it was not a success, and the attempt was abandoned. It is stated that as far as could be seen at this time no serious accumulation of scale had taken place and no danger arising from the formation of scale was anticipated.

The heater was made of copper, and was 2 ft. 3 in. in diam. by 4 ft. 2 in. in height. The shell was $\frac{3}{8}$ in. in thickness and had longitudinal lapped seam, sweated together by solder. The top of the shell was flanged outwards to receive the cover, which was dished in the centre for about 4 in. and was barely $\frac{1}{8}$ in. in thickness. The shell and cover flanges were each stiffened by a wrought-iron ring $\frac{3}{4}$ in. thick by 1 $\frac{1}{2}$ in. in width. The cover was secured to the shell by wrought-iron bolts $\frac{1}{2}$ in. in diam., pitched about 2 $\frac{1}{2}$ in. apart. The bottom of the heater was also dished, and was $\frac{1}{8}$ in. in thickness, its edge was flanged downwards and riveted to the shell by copper rivets $\frac{3}{16}$ in. in diam., pitched 1 $\frac{1}{8}$ in. apart.

GENERAL NEWS SECTION.

PERSONAL.

Commander Max K. Horton, commanding the British submarine which recently sank the German cruiser *Pommern* in the Baltic, has been decorated with the Order of St. George (Fourth Class).

At the meeting of the General Shipowners' Society, held on Tuesday, Mr. Howard Houlder (Houlder, Middleton & Co.) and Mr. F. W. Lewis (Furness, Withy & Co.) were elected to the committee.

The death occurred recently, after a long illness, of Mr. Allan Whitfield, who was associated with Messrs. Whitfield's Safe & Door Company, Birmingham. We understand that the business will be carried on under the same management as hitherto.

Captain Henry Brereton Hooper (Vice-Chairman and Joint Managing Director of the General Steam Navigation Company) has been appointed a Director of the Atlas Assurance Company in the place of the late Mr. Harry Mosenthal.

Mr. Charles E. Ellis has resigned his position as director of Messrs. John Brown & Co., Ltd., Thomas Firth & Sons, Ltd., and the Coventry Ordnance Works, in order to place his services at the disposal of the Ministry of Munitions. Mr. Ellis has been Managing Director of Messrs. John Brown & Co. for the last 25 years, and in addition to other appointments has served for many years as hon. treasurer of the Institution of Naval Architects.

The death is announced at Blyth of Mr. John Whitfield, a well-known shipowner and Lloyd's Agent at Blyth. Mr. Whitfield, who was 61 years of age, was head of the firm of Whitfield & Co., managers of the Tyne & Blyth Shipping Company, and was also a prominent personality in the North of England Steamship Owners' Association. He was also closely identified with several other shipowning and mining interests on the North-East Coast. He had been in poor health for about 12 months.

Mr. Heath Harrison, of the Harrison Line, has presented £10,000 to the Liverpool University for the endowment of a chair of organic chemistry. He has been greatly impressed by the importance to the country of the application of scientific knowledge to the solution of industrial problems, and this led him to make this generous gift. Some time ago he and his late brother and Mr. J. W. Hughes, also of the Harrison Line, presented to the University engineering laboratories costing £40,000.

Mr. H. J. W. Cox, Chief Engineer of the Cardiff-owned steamer *Southport*, was the recipient of a present at the Board of Trade Offices, Cardiff, last week for his great services in saving the vessel after she had been captured by the Germans. The *Southport* was seized by the German corvette *Geier* at St. Kusaie, Caroline Group, on September 4, 1914. About 150 tons of her bunkers were taken away and various parts of her machinery were disabled. The *Geier* then left and Mr. Cox and the other engineers set to work to repair the engines, and on September 18, after 14 days' hard work, their task was completed and the vessel sailed, and on September 29 arrived at Brisbane.

Mail advices from New York state that Mr. James French, Principal Surveyor of Lloyd's Register of Shipping for the Glasgow district, arrived there on the *St. Paul* on July 11. He is said to have entered on a tour of inspection of American shipyards as representative of the Committee of Lloyd's Register. It is understood that the present "boom" conditions at American shipyards have had much to do with the visit of Mr. French, as practically every vessel of importance now building in America has been designed with a view to meet the requirements of the Lloyd's Register as to structural strength and equipment. Mr. French was accompanied by Mr. Harold J. Cox, who is to be attached to the office of Lloyd's Register of Shipping at New York, for the purpose of assisting in the work of approving the plans of new vessels, which department is under the supervision of Mr. N. E. McClelland, Principal Surveyor.

Captain Thomas Golding, an Acting Elder Brother of Trinity House, has been chosen to represent that corporation on the Southampton Harbour Board, and the welcome extended to him last Thursday coincided with touching references to the death of Alderman H. Bowyer, R.N.R., a very old friend of his. Captain Golding mentioned that he put in his drills with Alderman Bowyer, and that Trinity House was extremely proud of the high attainments of the dead pilot, and of the fact that his fellow townsmen had twice elected him to the position of Mayor.

The death occurred last week, at Bristol, Rhode Island, U.S.A., of Mr. John Brown Herreshoff. Mr. Herreshoff was born at Bristol, Rhode Island, in 1841, and, although he became blind at the age of 15, he developed the faculty of designing boats which he had formed as a child, and in 1863 founded in his native town the shipbuilding firm of Herreshoff & Stone, the name being changed to that of the Herreshoff Manufacturing Company in 1879. He was joined by his two younger brothers, Lewis and Nathaniel, and the firm specialised in the construction of sailing yachts. They were responsible for the three famous American Cup defenders, *Vigilant*, *Defender* and *Columbia*.

FROM OUR CORRESPONDENTS.

CLYDE AND DISTRICT.

(FROM OUR OWN CORRESPONDENT.)

Glasgow.

The attention of shipowners and navigators is directed to the new regulations issued by the Admiralty with respect to the regulation of shipping traffic on the Firth of Clyde. The two light buoys which were placed some time ago on Dunoon Bank have been replaced by moored trawlers, and vessels entering or leaving the Clyde must pass between the two trawlers, which mark the gateway in the obstruction that now exists between Dunoon and Cloch Point. The trawlers will display signals to indicate whether the gate is open to inward or outward bound traffic or whether the gate is closed. No vessels are to approach within half a mile of the gateway until the special signals are hoisted, indicating that the passage is open for them, neither are inward bound vessels to approach within this distance when the signals are displayed for outward bound vessels and *vice versa*.

CLAN LINE AND SOUTH-WEST AFRICA.

British shipowners appear to be losing no time in taking advantage of the opportunities which are coming their way as a result of the war. This week the Clan Line of Glasgow announce that certain of their vessels on the South African service will include in their itinerary ports in the territory formerly known as German South-West Africa. It is probable that the amount of trade offering for this, the latest, British possession will not be large for some time, but the company attach a good deal of importance to being among the first in the field. The ports at which the Clan liners will call are Lüderitz Bay and Swakopmund.

TRANSHIPMENT AT GLASGOW.

The position of Glasgow in relation to the shipping traffic of the world was well illustrated last week by the shipment at the port of about 2,000 tons of steel pipes and tubes of various sizes and lengths by one of Messrs. P. Henderson & Co.'s liners, the *Pegu*. This consignment of tubes and pipes is part of a large order placed some time ago in America by the Burmah Oil Company. The material has been brought across from America by the Donaldson Line, and at Glasgow it has been transhipped to its destination by vessels of the Henderson Line. Goods from the East for the North American Continent are also frequently transhipped at Glasgow. For a few years back heavy shipments of rice have been brought to the Clyde by the Henderson Line, and then transferred to vessels of the Donaldson Line for conveyance to Canada. The war has, however, interfered to some extent with this trade, and during the

what it is that the production of coal should be fully maintained in the interest not only of the nation but also of our Allies.

PAYMENT FOR COST.

The proposal of the Welsh colliery owners to shorten the terms of credit from January 1 next from 30 to 14 days was discussed by the Cardiff Chamber of Commerce last week. Mr. T. E. Watson, of that city, on the subject, said that it brought into force it meant the "snuffing out of the small trader." After dealing with the credit extended to the colliery owner, he said that if they put their resolution into practice, the colliery owner would be able to carry on his business without working capital. He also hinted that it might be advisable for the coal shipping interest to take steps to form a protection association similar to that formed by a section of the colliery owners. It was finally decided to ask the colliery owners to reconsider the matter.

TRIMMING EXTRAS.

The Swansea Chamber of Commerce has been taking up the question of "extras" demanded by the railway companies on tipping charges. At the monthly meeting held the other day Mr. O. Harries, the owner of 14 vessels, said that for months he had kept his ships away from Swansea owing to the fact that the extra charges made in the port were greater than at other ports. Mr. Turpin, of the Richards, Turpin Shipping Company, said that until they could assure owners that the trimming tariff of Swansea would be respected they could not invite owners to send their vessels there when they were unable to definitely state what charge was to be made for trimming. Another important point was the fact that these "extra" charges had only been demanded since the outbreak of war.

FROM OUR OWN CORRESPONDENT.)

Liverpool.

Members of the shipping community here who have volunteered for the war are not to have their patriotic services unrecorded. The Committee of the Liverpool Exchange Newsroom have just decided to raise subscriptions towards the placing in the Newsroom of a worthy memorial of the Great War, which will contain the names of the 230 members now serving their country, five of whom have already lost their lives.

The Walker Engineering Laboratory of the Liverpool University, having lent all their lathes to the Liverpool Munitions Committee for immediate use in shell-making, are now assembling lathes lent to them for undertaking the important work of training men in their use. One has only to be in touch with the engineering establishments in the Mersey district to realise how readily they have responded to the calls made upon them, not only in turning out munitions themselves, but in giving up spare machinery that can be usefully employed elsewhere.

With the conquering of German South-West Africa being now an accomplished fact, the Liverpool steamship companies, who before the war had trading interests with that colony, but not direct from this country, are already considering the character of the steamship services that will be required from this country when the war is over. The other German colonies on the West Coast of Africa—Togoland and the Cameroons—are also included in the same proposition, and after the war it may be regarded as certain that the German lines will not be allowed to have the monopoly of the carrying trade to these countries which they have hitherto had from Hamburg.

Cardiff.

Some idea of the influence of the recent six days' stoppage of the Welsh miners is given in the coal export figures for the past week, which were down to the extent of 80,722 tons when compared with the six days preceding the strike. Appended are figures showing the foreign exports from each port for the weeks ending July 9 and July 23, 1915.

* Increase.

The above figures do not show the full effects of the strike, inasmuch as coastwise exports, the quantity sent by rail and the large amounts supplied to manufacturers are certain to have decreased proportionately, while the curtailed takings of the Admiralty are also not illustrated. They, however, show how

FROM OUR OWN CORRESPONDENT.

The Rotterdammer Reederei Gebr. van Uden has ordered a cargo steamer of 2,200 tons from the C. van der Giessen en Zonen in Krimpen an der Yssel shipyard, for delivery in 1916. The Reederie Zeevaart has ordered a 6,200-ton cargo steamer from the Rotterdamsecher Droogdock Mv.

We learn that the North of Ireland Shipbuilding Company, Londonderry, are to build two more vessels on the "Arch" principle of construction. These are to be practically duplicates of the steamers now being built on the "Arch" principle for Messrs. France, Fenwick & Co., The Pelton Coal Company and Messrs. W. A. Souter & Co. At the present moment there are five orders in hand for "Arch" steamers.

THE FREIGHT MARKETS.

(FROM OUR OWN CORRESPONDENTS.)

London.

The level of rates in the various freight markets have witnessed no marked change during the past few days. A moderate amount of fixing was done over the week-end from the Plate. The Gulf section maintains steadiness, but the Eastern market is slow. From San Lorenzo to the United Kingdom the *Ashmore* has been taken up at 62s. 6d., whilst the *Mars*, a larger boat, has been closed for the same business at 61s. 3d., August 15 to September 15. Following these fixtures, charterers were able to close business at 60s. for two other steamers, both giving October 10 cancelling. Eastern business is represented by the fixing of a vessel at 42s. 6d. from Karachi to the United Kingdom, barley, latter half of August. For ore business, Bombay has closed the steamer *Reapwell*, 5,500 tons, at 51s. 3d., to Mostyn Deep. From Bombay to Barrow, also with ore, the *Caspian*, 5,200 tons, has been conceded the same figure. From Java to Marseilles a 6,600-ton steamer has secured 70s. for August 25–September 10. For Gulf business, the *Harlesden*, 30,000 quarters, 10 per cent., has been closed at 10s. 6d. one, 10s. 9d. two ports, Naples-Salerno, August 10–25. To the Cape of Good Hope from the Gulf, for wheat or flour, 50s. is offered. A 650-stds. steamer has secured 248s. 6d. for timber to Rosario from the Gulf. On Form "O," 200s. is offered from Galveston or New Orleans to Archangel. A fair amount of time chartering was concluded at the end of last week. The *Dromore* was taken up at 15s. 6d. for Canada-United Kingdom business, whilst the *Evandale*, for a year's Transatlantic trading, obtained 12s. The *Vinland* has been closed at 13s. for one round trip, United States–Brazil. There is a demand for vessels for United Kingdom–White Sea rounds, and for this business a 3,400-ton boat has been conceded 25s., whilst the *Ebuoon*, 3,600 tons, has 1s. more, delivery Dublin, re-delivery United Kingdom. From the North Pacific Coast the rate is from 90s. to 95s. The *Strinda*, 11,000 tons, has been taken up at 92s. 6d. to the United Kingdom, September loading. Outward coal freights from the North-East Coast maintain steadiness, the most demand being for boats to load for French ports. For the Mediterranean, Genoa is worth about 25s., Gibraltar 18s., and Marseilles 24s. Rouen is steady at 14s. 6d. For London all the boats required can be secured at 7s. 3d. Cardiff reports a quiet and weak market. Representative fixtures are:—Bordeaux, 12½ fr.; Alexandria, 20s.; St. Nazaire, 11½ fr.; and Algiers, 17 fr. The *Egyptian Prince* has been fixed to load at Partington for Alexandria at 21s.

Glasgow.

At the close of the holidays last week the Glasgow market presented a pretty firm tone. Some business was done in the coal trade to the Mediterranean and to French ports, among the fixtures being:—Glasgow to Genoa, 5,500 tons, 21s. 6d.; Glasgow to St. Malo, 700 tons, 17s.; Ayr to Chantenay, 2,800 tons, 15.50 fr.; Firth of Forth to Calais, &c., 900 tons, 15s. 6d.; and Glasgow to Alexandria, 3,500 tons, 24s. 6d. There was some demand for tonnage for time charter, rates being steady at 14s. to 15s. for six months Transatlantic trading. The following fixtures were reported:—Time charter, White Sea trade, 3,400 tons, 25s., one round trip, delivery and re-delivery United Kingdom, prompt; time charter, Transatlantic trade, delivery and re-delivery United Kingdom, 12 months, 12s. In the American market some business was done in the grain trade, principally to West Italian ports, the rate to this quarter being from 10s. 9d. to 11s. per quarter. There were also tentative inquiries on the part of cotton charterers. The River Plate paid 60s. from San Lorenzo and 55s. from Buenos Ayres to the United Kingdom. A fixture or two was reported from Bombay but otherwise the East was quiet.

Newcastle-on-Tyne.

The volume of business done on the Newcastle freight market during the past week has been fully up to that of recent weeks, and it would seem that the position is improving slightly as time goes on. The licence difficulty is still a thorn in the side of ship-owners and shippers alike, and cases of steamers having waited for cargo licences for a considerable time are reported. In many instances the ship has sailed a few hours before the arrival of the licence. The South Wales strike does not appear to have affected the market much, although it was expected that a considerable quantity of tonnage would be diverted this way, thereby bringing down rates sharply. However, beyond a few large, unwanted steamers, there has not been much in the way of tonnage transfer,

and rates are, on the whole, about steady. Coasting has varied from 7s. to 7s. 6d. to London, but a small boat managed to obtain 8s. at a time when most of the available tonnage had been taken up. North France is again rather easier, and on the week Caen is 6d. cheaper; Honfleur, 6d.; and Havre from 6d. to 1s. 3d.; while Rouen and Dunkirk are on the weak side of late rates. The Bay is a poor market and Bordeaux has been done at from 18s. to 18s. 6d., a reduction of 6d. on last week's prices. The Mediterranean has been inactive, but recent rates have been well maintained. Genoa is just a shade easier at 25s., but Marseilles has hardened slightly to from 24s. to 24s. 6d. Fixtures arranged since the last report include the following:—Bordeaux, 1,800, 19s. 6d.; 4,500, 18s., recharter; 1,500, 18s. 6d.; Brest, 1,600, 13s. 6d.; Boucau, 3,500, 18s.; 1,200, 18s.; Boulogne, 600, 13s.; 400, 18s. 6d., coke; Caen, 1,600, 13s. 6d.; 700, 13s.; Calais, 300 tons coke, 20s.; Dunkirk, 700, 13s. 6d.; 2,000, 13s.; 20s., coke; Fécamp, 1,600, 13s. 6d.; Gibraltar, 3,500, 18s. 6d.; 3,200, 18s.; Genoa, 3,500, 25s.; 5,000, 25s.; 4,500, 25s.; Honfleur, 1,600, 13s. 6d.; Havre, 700, 12s. 9d.; 13s. 6d.; London, 1,700, 7s. 3d., C.T.; 600, 8s.; 3,000, 7s.; Lisbon, 3,000, 17s. 9d.; Malaga, 2,000, 23s.; Marseilles, 1,250, 24s. 6d.; 2,400, 24s., 600; Oporto, 1,500, 20s.; Port Said, 5,500, 24s.; 7,500, 24s.; Rochefort, 1,500, 18s.; Rouen, 1,600, 14s. 6d.; 2,100, 14s. 6d.; 1,600, 14s. 9d.; River Plate, 5,500, 28s.; Savona, 3,600, 25s.; St. Servan, 1,000 13s. 6d.; St. Nazaire, 2,300, 17s.

Liverpool.

This market bears a steady and improving tone, and only in respect of coal outward freights is there an easier feeling. These latter will soon adjust themselves when the tonnage attracted from South Wales while the strike was on has been worked off. Ships have been fixed outwards as under:—Partington (Ship Canal) to Huelva, at 15s. 6d.; Birkenhead to Huelva, at 15s. 6d.; Liverpool to Copenhagen, 22s.; and Liverpool to Barcelona, 19s. 6d. Time charter rates are firmer, one White Sea round, delivery and re-delivery United Kingdom, making 17s. Homeward freights are decidedly better and there is more inquiry about. The Plate has come on as was generally expected, and several August fixtures have been made, San Lorenzo to United Kingdom, at 62s. 6d., which is an advance of 7s. 6d. on a week ago. There are indications of the market rising further for September tonnage. North American freights are also hardening, and Gulf grain rates to West Italy are now worth 11s. 3d. Northern Range is paying 10s. to Piræus, and 7s. 9d. to Liverpool for heavy grain, August. Eastern markets are steadier, and Kohsichang quotes 70s. to United Kingdom, and Saigon to France 72s. 6d. to 75s. for meal. India dull, but not altogether devoid of inquiry, on basis of 52s. 6d. from Bombay, and 43s. 6d. from Karachi, wheat. Australia has come on the market for December tonnage on basis of 65s. from Freemantle to United Kingdom, with 5s. extra North France. Mediterranean homewards quiet but steady. North Pacific firmer, and 92s. paid to United Kingdom, August–September loading. The demand for sail tonnage from the North Pacific keeps good, and 80s. continues to be paid to the United Kingdom for December.

Cardiff and Swansea.

The serious dislocation caused in the Welsh coal and shipping trades by the Welsh coal strike is fully reflected in the movement of the outward freight market during the past week. From Cardiff tonnage aggregating only 81,100 tons was fixed last week, or 19,400 tons less than in the previous week, which, by the way, also registered a big drop on the preceding week. Stems since the resumption of work on the part of the miners have been very congested, while available tonnage supplies were greatly in excess of the demand and consequently rates sharply fell away, dropping to levels which establish new low records for the current year. In our Editorial Notes we deal more fully with the enormous decrease which has taken place, while the Difficulties of the Coal and Shipping Trades is also the subject of an article in the current issue. Fixtures reported for the Mediterranean were:—Alexandria, 23s. (500 tons delivery), 20s. 6d. (700 tons delivery) and 20s. (500 tons delivery, a new low record); Algiers, 17 fr. (a new low record); Genoa, 20s. 6d.; Genoa with options, 20s. 6d. (twice) and 17s. 6d. (twice, a new low record); Gibraltar, 14s. 6d.; Lisbon, 12s. 6d. (350 tons delivery); Marseilles, 24, 20 (twice) and 18 fr. (a new low record); Naples-Torre Annunziata-Salerno, 16s. (800 tons delivery, a new low record); Naples-Leghorn, 15s. 3d. (800 tons delivery, a new low record); and Port Said, 22s. 6d. For the Bay and Coast rates also collapsed, Bordeaux accepting 15 (twice) and 12½ fr. (a new low record); Bayonne, 13 fr. (twice); Boulogne, 10s. (twice);

Hull.

Bitumastic at Panama.

The following is an extract from the report of the Engineer of Maintenance, Culebra, Canal Zone, dated July 15, 1914:—"Under the action of the water of Gatun Lake, which at times contains considerable sulphurated hydrogen, organic matter and other impurities, none of the paints, except the Bitumastic, has proved entirely satisfactory. In those parts of the gates that are continuously under water the paints are, in many places, in poor condition, although the gates have been in service only a short time. The parts not continuously under water so far remain well protected, as well as the portion which is never submerged."

Furness, Withy & Co.

The 24th annual meeting of Furness, Withy & Co., Ltd., was held at the registered office, Royal Liver Building, Liverpool, on Saturday, July 24, Lord Furness, Chairman of the company, presiding.

Mr. F. W. Lewis (Deputy-Chairman) said the strength of the company's position, as disclosed by the balance-sheet and accounts, must be a source of extreme satisfaction to the shareholders, who, he was sure, would also cordially support the conservative policy of the Board in regard to the appropriation of the profits of the company. They had to remember that they were passing through a period of national crisis, and, whatever the result might be, of one thing they could be quite sure, and that was that things would never be quite the same again, and it behoved all prudent managers to conserve, as far as they possibly could, the resources of the businesses which they controlled. The Chairman had told them that 50 per cent. of their tonnage was on Government service, but in addition a large number of steamers owned by their subsidiary and associated companies had been requisitioned. It was true that the rates of freight paid by the Admiralty on an average were less than one-half of what could be earned in the open market, but, inasmuch as the increase in freights generally was principally due to the Admiralty demand, he did not think any shipping companies could complain on this score so long as the requisitioning of tonnage was regulated, as far as possible, on a proportionate basis, which the Admiralty were endeavouring to do. It had been suggested in some quarters

that shipowners had taken advantage of the position to raise freights, but any comparison of rates of freight without taking into account the increased war risk expenses, wages, stores, coal and abnormal conditions at loading and discharging ports was exceedingly misleading. It would interest them to know that the amount of premium paid out for war risk insurance alone from the commencement of the war up to the middle of this year by their company and their associated companies amounted approximately to £350,000.

The report was adopted.

COMPANY REPORTS.

The Nederlandsche Schifffahrt Unie. paid 7.1 per cent. dividend in 1914, against 10.3 per cent. in 1913.

Cressington Steamship Company, Ltd.—Interim dividend at the rate of 12 per cent. per annum for the first six months of the year.

Holzapiels (Ltd.).—Interim dividend on the ordinary shares at the rate of 4½ per cent. (less tax). Last year the dividend was at the rate of 5 per cent.

Cuxhaven-Brunsbüttel Dampfer Akt. Gesell. declares 5 per cent. dividend for 1914, and the retiring members Engel and Gotthelf of the board of directors were re-elected.

Regent's Canal & Dock Company.—There will be no dividend for the past half-year, compared with 1 per cent. last year. The balance carried forward is £1,555 (£833 last year).

The Zeeland Dampfschiffahrts Gesell., Amsterdam, running a regular passenger service between England and the Continent, obtained good results last year, but reports poor prospects for 1915. Last year the gross receipts were £273,000 (£225,000 in 1913) and the net receipts £134,000 (£84,300). The number of passengers carried was 200,582 (169,705) and the cargo tonnage was 78,427 (70,901) tons. After transferring £112,500 to depreciation, 10 per cent. dividend was declared (6 per cent. in 1913).

Russian Transport and Shipping Companies.—The steamship Company "Oka" realised £38,000 net profit in 1914 and distributed 12 per cent. dividend on its £106,000 share capital. The company "Kawkas & Merkur," one of the largest Russian inland shipping companies, realised £56,700 (£69,000) net profit in 1914, of which amount £54,200 was applied to sinking fund. The company for shipping and commerce on the Amur paid 8 (10) per cent. dividend on £265,000 share capital from a net profit of £26,600. The Tscherepowetzer Steamship Company, "Sewer," with £53,000 capital, is founded for navigation of the Volga and the ways of the Marien system.

W. & C. T. Jones' Steamship Company, Ltd.—The report for the year ended June 30 states that the total profit amounts to £90,875, to which must be added £6,027, being balance brought forward from last year's account, making a total of £96,902. It is proposed to appropriate this amount as follows:—Dividend at 2s. per share £28,000, interest £4,157, insurance reserve (bringing this fund up to £21,000) £5,000, re-classing account £5,000, income-tax £3,770, depreciation £40,000, carrying forward to next year £10,975. Only accounts for voyages actually completed on or before June 30, 1915, are dealt with in these figures. The insurance fund now shows a credit of £21,000, and the risk taken by the company on each steamer remains at 12½ per cent. on the insured values. Profits and dividends of the company from 1912 are as follows:—

Year.	Profit.	Dividend.
	£	
1912	69,544	5 per cent.
1913	105,268	10 ..
1914	54,718	5 ..
1915	90,875	10 ..

Fargrove Steam Navigation Company, Ltd.—The report for the year ended March 31 states that the balances of the completed voyages amount to £102,935, and after debiting insurance the gross revenue is £61,193. The cost of insurance is £41,743, of which about £9,000 is for war risk. The insured value of the steamers is £401,000. The sum of £10,000 has been written off steamers' cost account, and after deducting proceeds of sale of ss. *Tuskar* and transferring ss. *Farn* to suspense account the book value of the steamers amounts to £244,000. Insurance reserve has been increased by £10,000, raising this fund to £56,000. Including the amount brought in, the balance of profit and loss account (after charging

insurance, general repairs, income-tax, &c.) is £55,832, which is dealt with thus:—10 per cent. dividend paid to March 31; amount written off steamers, £10,000; added to insurance reserve, £10,000; amount written off Consols, £1,000. At the present time all the steamers are profitably employed. Since closing the accounts the two oldest steamers, ss. *Wolf* and ss. *Bardsey*, have been sold at satisfactory prices, and a portion of the proceeds, £20,000, has been invested in the new War Loan.

Deutsch-Australische Dampfschiffs Gesell. (Hamburg).—Business in 1914 was not so good as in the previous year, but still satisfactory. The outbreak of war destroyed mid-year prospects of a revival in business; a large number of the company's vessels were then in home harbours and most of the remainder reached neutral ports. Three ships at Antwerp were considerably damaged by explosives before the Belgian evacuation. The remaining ships in enemy harbours are said to be in use (by us or our Allies). It is complained that three steamers were compelled to leave the Suez Canal and then seized as prizes. The directors do not know precisely how many ships remained to them at the end of the year. The four new vessels *Hof*, *Freiburg*, *Ulm* and *Lübeck* are in neutral ports, and of the seven other vessels under construction during 1914, one has been sold to a Hamburg owner. The company has subscribed to a coal-trading company (serving the interests of Eastern shipping) and to the Deutschen Seeversicherungs-Gesell. of 1914. The balance sheet shows assets:—Steamers and instalments on new construction, £2,210,000 (£2,220,000); shares, £15,650 (£15,200); bills, £47,500 (£46,000); bank balance, £1,960 (£34,700); debtors, £47,000 (£7,800). Liabilities:—Creditors and bills of exchange, £176,000 (£235,000); uncompleted voyages, £343,000 (£338,000). The insurance reserve amounted to £540,000 (£530,000). The profit and loss account shows:—Working profit, £271,000 (£462,000); interest, &c., £2,650 (£1,920); transfer from insurance reserve, £105,000 (nil); total gross revenue, £378,000 (£465,000). There were paid:—Interest on loans, £1,425 (£1,620); taxes, &c., £67,000 (£8,330); directors' fees, £1,950 (£2,430); provision for employees, £11,650 (£14,250); depreciation, £247,000 (£295,000). From the £49,100 (£142,500) net profit, 5 per cent. (14 per cent.) dividend was paid and £620 (£6,200) allocated to directors. By transferring £105,000 from insurance reserve to profit and loss account, the gross profit was brought to £380,000 (£463,000). Depreciation on the fleet amounted to £240,000.

NEWS PARAGRAPHS.

Anchorage Supertax at Genoa.—An Italian Royal Decree has imposed an anchorage supertax on all vessels anchoring in Genoa Harbour from July 1 last.

West Indian Steamer Service.—A Reuter message from Port of Spain (Trinidad) states that the Royal Mail Steam Packet Company notifies the termination of the existing contract and proposes to substitute an 11-knot service monthly on half the subsidy.

Vessel Fired by Submarine.—The Danish schooner *Charlotte* has landed at Frederikshavn the crew of the Norwegian vessel *Nordlyset*, which was set on fire by a German submarine on Monday off Cape Lindesnæs. The *Nordlyset* was bound from Arendal to Granton with a cargo of pit-props.

The "Belle" Fleet.—We learn that the "Belle" passenger steamers have been placed in the hands of Messrs. T. W. Tamplin & Co. for sale by private treaty. The six vessels were built by Messrs. William Denny & Bros. between 1890 and 1898, and vary in size from 332 to 738 gross tonnage, with speeds from 14 to 19 knots.

Royal Naval Reserve.—The Mercantile Marine Service Association has been officially informed by the Admiralty that mercantile marine officers are urgently required for entry in the Royal Naval Reserve as temporary sub-lieutenants. The qualifications are that they must hold at least a first mate's certificate and be between the ages of 21 and 33, and the applications of officers slightly over the latter age will be considered.

New Blue Funnel Line Service.—The Blue Funnel Line vessel *Idomeneus* arrived at Cristobal from Liverpool, by way of Kingston, with 700 tons of cargo for San Francisco on July 5. After the completion of coaling at Cristobal, she went through the Canal and loaded 1,000 tons of pipe and 100 tons of machinery, belonging to the Union Oil Company, for Los Angeles. The passage of the

Spanish Shipping Strike.—Steamship companies at Barcelona and Bilbao have withdrawn their men that a strike there will last until July 28.

Manchester Ship Canal.—The traffic returns for June of the Manchester Ship Canal show that the receipts amounted to £77,477, as against £69,698 for June, 1914. The total for the year to date is £500,292, as against £327,285 for the corresponding period of 1914, the net increase being £173,007.

A German Shipping Company's Action.—Evidence has been produced before a Senate at the Handelssenate, under the presidency of Dr. Gumbert, in the action for damages brought by the Harbours, Aussen Line and Norddeutscher Lloyd against the Austro-Americana. An amount of 15,000 kr. is claimed, distribution of 8 per cent. dividend having been decided upon at the general meeting of the Austro-Americana, whilst the Bank-Verein had announced telegraphically a 9 per cent. dividend. A number of witnesses have been called and the president's written decision is now awaited.

New Orient Line Calendar.—The new Calendar, July, 1915-June, 1916, published by the Orient Line embodies a striking picture by Mr. Norman Williamson of the new Orient liner *Ormonde*, the



Orient Liner "Ormonde."

latest vessel building to this company's order at Clydebank. The *Ormonde* is 15,000 tons gross and has a cruiser stern.

The Command of the Sea.—A short but eloquent announcement in the *Hamburger Nachrichten*: "The representative of the Holland-America Line informs us that there are not delays in the transport of goods of German, Austrian or Turkish origin to America, but such

goods can only be shipped if accompanied with a special permit from the British Government. The italics are our own.

The War and German Shipping.—According to figures reproduced by *Harper*, 17 German shipping companies, with a share capital of £5,600,000 in 1913 and £5,710,000 in 1914, averaged 19.4 per cent. net profit in 1913 and 5.6 per cent. in 1914, whilst the average dividend paid was 12 per cent. in 1913 and only 3.4 per cent. last year.

Lübeck Fleet.—According to the latest report of the Handelskammer, there were registered in Lübeck at the end of 1914, 1 sailing vessel and 54 steamers with 5,400,000 cubic ft. net capacity. In 1910 there were 59 vessels with 5,850,000 cubic ft. net capacity and in 1900 the net capacity was only 885,000 cubic ft., practically the same as in 1840. The number of vessels registered at Lübeck for traffic on inland waterways increases steadily and rose from 292 vessels of 25,266 tons capacity in 1910 to 393 vessels of 33,950 tons capacity in 1914.

New Peru-Europe Service.—The steamship company Peruana de Vapores y Dique del Callao (Lima) has decided to take advantage of the paralysis of Gallian shipping and of the increased freights on British lines from the west coast of South America to Europe, by working some of their own steamers from Peru and Ecuador through the Panama Canal to Europe. The steamer *Urubamba* was the first to start this service in the middle of April. She took on ore, copper and cotton at Callao and a large lot of cacao at Quayaquil, and is probably bound for Liverpool, Havre or Rotterdam. At least so long as present rates prevail, this service should be very lucrative to the company. For the present, monthly sailings are proposed, the company having five steamers available and having to maintain coast traffic and regular cargo and passenger service between Peru and Panama.

General Shipowners' Society.—Presiding at the annual meeting held in London on Tuesday, Sir Edward Hain said that at the present time wages, the cost of material, in fact, the price of every commodity necessary for a ship had advanced by 50 per cent., while the cost of war risk insurance had been an additional charge upon shipping. During the war neutral shipping had reaped a very rich harvest by engaging on voyages prohibited to British vessels. It had been stated that the profits of the Greek mercantile marine for the current year would amount to £3,000,000, and other neutrals would probably show a proportionate result. Thus our competitors were in a much stronger financial position to develop their mercantile fleets and to compete with us than ever before. America for many years had been feeling her way to the establishment of a mercantile marine, and America's natural ambitions in that direction had been strengthened by her possession of the Panama Canal. Sir Edward forecasted an extension of shipbuilding facilities in the United States and an increase in their competition with the yards in the United Kingdom. It was of the highest importance that the mercantile marine should issue from the war with financial resources unimpaired, so that our supremacy in shipbuilding, marine engineering and shipowning should be fully maintained, and that the host of labour dependent upon the success of shipping in all its branches should be fully employed.

"SHIPBUILDING AND SHIPPING RECORD" TABLE OF LAUNCHES.

Date of Launch.	Name of Vessel and Type.	Owners.	Builders.	Approx. Dimensions. L. x B. x D.	Propelling Machinery and Builders of Machinery.	Remarks.
Jun. 15	Leonora, s.s. (cargo).	Deutsche Handels-Gesellschaft, Hamburg.	Walters, Engineering & Shipbuilding Co., Rotterdam.	250 x 34 x 16.	Tr. Exp. 15, 25, 41, 36.	1,800 tons; dry dock at 14.
7	Fraser, Rivet, (cargo).	Deutsche Handels-Gesellschaft, Hamburg.	Deutsche Schiffbau-Gesellschaft, Hamburg.	302 x 31 x 26.	Tr. Exp. 25, 40, 67.	6,450 tons; dry dock at 14.

"SHIPBUILDING AND SHIPPING RECORD" TABLE OF TRIAL TRIPS.

Date of Trial Trip.	Name of Vessel and Type.	Owners.	Builders.	Approx. Dimensions. L. x B. x D.	Propelling Machinery and Builders of Machinery.	Remarks.
Feb. 27	Emma Heugel (brawler).	Deutsche Handels-Gesellschaft, Hamburg.	Deutsche Schiffbau-Gesellschaft, Hamburg.	110 x 27 x 10.	Superior 1100 h.p.	
Feb. 27	Kristiansand, s.s. (cargo).	Deutsche Handels-Gesellschaft, Hamburg.	Deutsche Schiffbau-Gesellschaft, Hamburg.	110 x 27 x 10.	Tr. Exp. 15, 25, 41, 36.	2,000 tons; dry dock at 14.

OFFICIAL NOTICES AND SHIPS FOR SALE.

FOR SALE.

(PARTICULARS NOT GUARANTEED.)

Folio 5414.—Built 1910. Surveyed 1915. About 6,900 tons d.w. on about 23 ft. draught. Single Deck. Triple Engines. Three Single-ended Boilers. Speed about 12 knots on about 20 tons.

Folio 5255.—Built 1900. About 6,000 tons on about 24 ft. 9 in. draught. Shelter Deck. Triple Engines. Two Single-ended Boilers. Speed about 12 knots on about 20 tons.

Folio 7751.—Built 1898. Surveyed 1911. About 5,550 tons d.w. on about 22 ft. 6 in. draught. One Deck and Spar Deck. Triple Engines. Two Single-ended Boilers. Speed about 9-9½ knots on about 20 tons. Prompt Delivery.

Folio 6449.—Built 1891. Surveyed 1912. About 4,400 tons d.w. on about 22 ft. 6 in. draught. Well Deck. Triple Engines. Two Single-ended Boilers. Speed about 8½ knots on about 14 tons.

Folio 3425.—Built 1901. Surveyed 1914. About 3,400 tons d.w. on about 17 ft. 10 in. draught. One Deck. Triple Engines. Two Single-ended Boilers. Speed about 8½ knots on about 14 tons.

Folio 8254.—Built 1903. Surveyed 1912. About 1,450 tons on about 14 ft. 10 in. draught. Well deck. Triple Engines. Two Single-ended Boilers. Speed about 8½ knots on about 12 tons.

For further particulars, plans, prices, &c., apply to:—

THOS. PINKNEY & SONS,
Sunderland.

Telegraphic Address—"Spardeck."

FOR SALE.

Folio 4150. Steel single-deck steamer, long bridge. Built 1903. About 5,400 tons d.w. on 22½ ft. draught. Triple Engines. Two single-ended boilers. Speed 8½ knots on about 17 tons. Delivery U.K. in August.

Further particulars, plans, price, &c., on application.

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OFFICIAL NOTICES AND SHIPS

FOR SALE.

OFFICIAL ADVERTISEMENTS intended for insertion on this page should be sent in as early in the week as possible. The latest time for receiving official advertisements for this page for the current week's issue is noon on Wednesday.

All advertisements should be addressed to:

Shipping and General Record

Queen Anne's Chambers,

Westminster, London, S.W.

"SHIPBUILDING AND SHIPPING RECORD" TABLE OF SHIP SALES.

Name and type.	Tonnage.	Dimensions. Draught in (ft.).	Sold by, to	Builders, hull and year.	Machinery and builders.	Remarks.
Alameda , s.b. (iron) (part awning dk.)	3,158 gr. 1,939 net.	31½' x 41' x 17½'	Alaska SS. Co., Seattle, U.S.A., to Carranza Party, Mexico	W. Cramp & Sons, Philadelphia (1885)	29, 17, 78 x 51	
Atlanta , ss. ...	2,094 gr. 1,399 net.	225½' x 42' x 14½'	Chesapeake SS. Co., Baltimore, to Carranza Party, Mexico	W. Cramp & Sons, Philadelphia (1896)	21, 18, 72 x 56 (W. Cramp & Sons)	
Budrie , ss. (ex <i>Cocaine</i> , ex <i>Golemdin</i>)	2,252 gr. 1,613 net.	285' x 36½' x 23'	Arab Steamers, Bombay, to British buyers	A. & J. Inglis, Ltd., Glasgow (1882)	34, 60 x 47 (A. & J. Inglis)	
Burrumbett , ss. (well dk.)	2,420 gr. 1,561 net. 3,054 dw.	300' x 40' x 19½'	Huddart Parker, Ltd., Melbourne, to Shanghai buyers	Swan & Hunter, Newcastle (1885)	20, 11, 65 x 42 (Widson Slipway Co.)	
Colon , ss. (ex <i>Mexico</i> awning dk.)	5,667 gr. 4,193 net.	360' x 50' x 32½'	Panama Canal Authorities, to Panama Railroad Co., New York	W. Cramp & Sons, S.B. & E. Co., Philadelphia (1899)	27, 11½, 68 x 42 (W. Cramp & Sons)	Price, \$888,700
Duisburg , ss. (spar dk.) (re-named <i>Burgemeister von Melle</i>)	4,496 gr. 2,854 net.	388' x 47½' x 20½'	Deutsch-Anstral. D.G., Hamburg, to Reederei G. J. H. Siemers, Hamburg	Flensburger Schiffsb. Ges., Flensburg 1900	28½, 47½, 73 x 54 (Flensburger Schiffsb. Ges.)	
Ecclesia , ss. ...	3,714 gr. 2,385 net.	339½' x 51' x 25'	Manchester & Salford SS. Co. (Sawright, Bacon & Co.), Manchester, to British buyers	J. L. Thompson & Sons, Sunderland (1904)	24, 49, 67 x 45 (J. Dickinson, Sunderland)	
Filomachi , ss., ex <i>Queen Olga</i> (spar dk.)	3,347 gr. 2,146 net.	230½' x 42½' x 19'	F. Lukissos & Voyazides Bros., Andros, to buyers not stated	Bartram, Haswell & Co., Sunderland (1894)	24, 39½, 60 x 42½ (J. Dickinson & Sons, Sunderland)	—
Hans B. , ss. ...	4,255 gr. 2,711 net.	365' x 50½' x 26'	Akties. Borgen (G. E. Stoesen, Mgr.), Bergen, to Norwegian buyers	W. Gray & Co., West Hartlepool (1911)	26, 42, 70 x 48 (Cen. Mar. Eng. Works, West Hartlepool)	
Llanthony Abbey , ss. (well dk.)	2,425 gr. 1,526 net.	290' x 39½' x 18½'	Pyman, Watson & Co., Newport, to British buyers	Roper & Son, Stockton (1890)	22, 36, 50 x 39 (Blair & Co., Stockton)	Price about £20,000
Malmstad , ss. (spar dk., ex <i>Dredgeter</i>)	4,008 gr. 2,599 net.	360½' x 50' x 19½'	Dnpsk Akties. Malmstad (Grefstad & Herlofson), Arendal, to buyers not stated	A. McMillan & Son, Dumfries 1906	25, 41, 67 x 48 (Clyde S.B. & Eng. Co., Port Glasgow)	Price about £35,000
Marietta Kali , ss. (pt. awning dk.)	2,301 gr. 1,454 net.	190' x 38' x 19½'	S. A. Siderides, Pireus, to buyers not stated	Furness, Withy & Co., West Hartlepool (1891)	22, 36, 59 x 39 (W. Allan & Co., Sunderland)	Price about £24,000
Matador , ss. ...	658 gr. 292 net.	185½' x 29½' x 11½'	J. D. Strucken, Bremen, to Reederei Aug. Bolten, Hamburg	G. Seebach, A.G., Bremerhaven (1904)	15, 24, 39½ x 28½ (G. Seebach, A.G.)	
Oswiga , ss. (ex <i>St. Johann</i> (re-named <i>Wotan</i>))	3,390 gr. 2,140 net.	346' x 48' x 25'	Rhederei Akt. Ges. von 1896, to Wotan Schiffahrt Ges., Duisburg	Chant. Nav., Anversen, Hoboken (1908)	21, 41, 66 x 46 (N.E. Mar. Eng. Co., Sunderland)	
St. Patrick , ss. ...	2,419 gr. 1,475 net.	306' x 44½' x 20'	Angl. Aktieb. St. George (Th. Willemburg, Mgr.), Gothenburg, to A. H. Matthiesen, Christiania	Craig, Taylor & Co., Stockton 1905	22, 36, 58 x 39 (N.E. Mar. Eng. Co., Sunderland)	Price about £14,000
Segura , s.v. (ex <i>Sueta Segura</i> , ex <i>Shere Dard</i>)	1,842 gr. 1,700 net. 2,820 dw.	265' x 39½' x 23½'	W. Bowen, Llanelly, to Plisson, S.N. Co., Cardiff	J. Reid & Co., Port Glasgow (1883)		Offered for sale last May but withdrawn at £3,600. Now sold at about £4,000.
Treasury , ss. (pt. awning dk.)	2,956 gr. 1,885 net.	325' x 43' x 20½'	Treasury S.S. Co. (W. Thomas, Sons & Co., Mgrs.), Liverpool, to British buyers	Palmer's Company, Newcastle (1896)	22½, 36½, 61 x 42 (Palmer's Company)	

accounts issued a week ago. The Furness Withy group has also strengthened on the favourable statements made at the meeting. There has been a weaker tendency among the larger companies' issues, but it is not attributed to anything more than a few sales made by holders for the purpose of meeting the first instalment upon the War Loan. There are still a few notes which are being realised, and executors who find themselves unable to realise the securities having a fixed minimum, are disposing of steamship companies' shares. These, in comparison with most other securities, have a profit in some instances on prices a year ago. The Mersey Docks and Stevedoring Company, if we may judge from the increase in the interim dividend from 3, per cent. to 5 per cent., has recovered from the temporary reduction of profits indicated in the 1914 accounts. The dividend is on the March 1915 basis, and if profits are maintained it would appear probable that the directors will be in a position to affirmatively declare the final dividend so as to make the full year's return up to 20 per cent. The company is following the policy outlined by the directors at the meeting last February in making no further contracts for a new ship until the prices become more favourable.

SHIPPING AND DOCKS.

Name.	Share £100	Dividend £ per share	Yield.	Quota- tion, July 30, 1911.	Price during week.
African S.S.	1	112 19	7	18 20	—
Anchor Line ... Deb.	10	98 89	4	93 95	—
Argentine Nav. ... Cum. pref.	10	104 10	7	10 10	10
Do. ... Deb.	Stk.	98 89	4	144 106	104
Do. ... Cum. pref.	1	296 15	3	—	—
Do. ... Deb.	Bds.	141 100	6	95 100	94
A. & C. V. S. N. ... "A"	Stk.	84 84	4	100—63	—
B. & A. V. S. N. ... "B"	Stk.	102 10	4	100—63	—
B. & A. V. S. N. ... "C"	Stk.	104 88	4	99 100	94
Bucknall S.S. ... Cum. pref.	1	22 14	—	—	—
Cairn Line ... Deb.	Bds.	102 94	—	91—93	—
Clan Line ... Ord.	1	142 8	15	102—11	13
Court Line ... Ord.	41	—	10	9	—
Cunard S.S. ... Cum. pref.	1	35 9 18	20	12 12	2
Do. ... Deb.	Stk.	103—97	—	99 101	99
Do. ... Cum. pref.	Stk.	102 10	14	101—103	99
Elder Line ... Deb.	Stk.	103 10	14	98—102	100
Elder Dempster ... Cum. pref.	1	1 1	8	102—104	—
Do. ... Deb.	Stk.	103 89	—	102—104	—
Ellerman Lines ... Pref. Ord.	10	103 10	6	10—10	—
Do. ... Cum. pref.	10	10 10	4	10—10	—
France Fenwick ... Cum. pref.	1	47 6 9	6	44 5	—
Furness, Withy ... Ord.	1	34 3—25 6	10	14 12	—
Do. ... Cum. pref.	10	94 94	5	94—10	—
General Steam Nav. ... Ord.	1	64 54	6	64 54	—
Do. ... Pref.	1	64 54	6	74 74	—
Holder Line ... Cum. pref.	5	55 60	Nil.	21—21	—
Do. ... Deb.	Stk.	84 80	4	81—86	83
Holder Bros. ... Cum. pref.	5	48 3	4	44—44	—
Do. ... Deb.	Stk.	95—78	4	81—86	90
India, Ceylon & Rly. ... Ord.	10	94 74	8	9—10	—
India, Ceylon & Rly. ... Pref. Ord.	1	94 74	8	94—44	—
Iravaddy Flotilla ... Ord.	4	125 114	15	126 128	—
King Line ... Deb.	Stk.	87—79	4	84 94	10
La Guaira Harbour ... Deb.	Stk.	14 1	4	73—80	73
Lampart & Holt ... Cum. pref.	41	14 1	4	14 1	—
Leyland (F.) ... Cum. pref.	10	11—98	10	77 8	—
Do. ... Deb.	100	99 94	4	99—101	—
Mercantile S.S. ... Ord.	1	84 84	17	6—6	—
Do. ... Pref.	1	12 16 3	7	8 1	—
Moer Line ... Ord.	10	14—11	15	—	—
Nelson Steam Nav. ... Deb.	100	103 99	5	99—101	97
New Zealand ... Ord.	8	20—10	8	14 10	19
Do. ... Deb.	Stk.	95—92	4	92—94	—
Nitrate Producers S.S. ... Ord.	1	82 8	12	8 8	12
Do. ... Cum. pref.	5	5—97 6	—	43—5	—
Oceanic Steam Nav. ... Deb.	100	100 96	5	97—99	93
Orient. Steam Nav. Co. Cum. pref.	10	104 94	4	94—10	—
Do. ... Deb.	100	99—94	4	98—100	98
P. & O. S. N. ... Cum. pref.	100	125 107	5	109—112	94
Do. ... Deb.	100	150 27	6	270—290	262
Do. ... Deb.	Stk.	91—83	4	84—86	84
Prater Line ... Ord.	1	25 3—20 5	3	1—1	—
R.M.S.P. ... Ord.	100	143—100	Nil.	82—87	73
Do. ... Pref.	Stk.	100 96	—	98—101	87
Do. ... Deb.	Stk.	104 100	4	101—103	89
Shaw, Savill & Alb. Cum. pref.	5	52—96 3	6	11 5	—
Shell Transport ... Ord.	1	54—96 10	6	4—4	—
Do. ... Cum. pref.	10	11 10	5	102—102	—
Sutherland S.S. Co. ... Ord.	1	1 1	20	1 1	—
Union-Castle S.S. ... Cum. pref.	1	1 1	4	83 94	—
Do. ... Deb.	Stk.	95—92	4	93 95	—
Union S.S. of N. Z. ... Deb.	Stk.	95—91	—	—	—
West Hartlepool ... Pref.	1	4 1	Nil.	24 24	—

IRON AND STEEL.

Name.	Share and paid.	Extreme quotations, 1913.	Last ann. div. % or per share.	Yield. %	Quota- tion, July 30, 1914.	Cash price during week
£						
Babcock & Wilcox... .. Ord.	1	69 45-68 11	16	5 1/2	28-2 1/2	2
Baldwins Cum. pref.	1	22 1/2-21 3	5 1/2	5 1/2	1 1/2-1 1/2	1 1/2
Do. Deb.	Stk.	100-100 1/4	4 1/2	4 1/2	97-99	99
Baxters, James Cum. pref.	1	—	5	7 1/2	3-3	—
Bell Bros. Cum. pref.	10	12 1/2-11 6	5 1/2	11 1/2-12 1/2	10 1/2-11 1/2	10 1/2
Do. Deb.	Stk.	98-99 1/2	4	98-98	96-98	96-98
Bessemer (Henry) Ord.	1	1 1/2-1 1/2	10	1 1/2-1 1/2	1 1/2-1 1/2	1 1/2
Blackw Vaughan Ord.	1	22 1/2-19 1/2	6	6 1/2	14-14 1/2	14 1/2
Do. Cum. pref.	20	21 1/2-20 1/2	6	20-21	19 1/2-20 1/2	19 1/2
Cargo Fleet Iron Ord.	1	11 104-75 3	2 1/2	15-15 1/2	15-15 1/2	15 1/2
Do. Deb.	100	91-87 1/2	3 1/2	89-92	87-90	87 1/2
Consett Iron Co. Ord.	1	88 1/2-74 1/2	30	7 1/2	33-37	33 1/2
Dominion Iron & Steel Bds.	1	100 1/2-88 1/2	5	83-87	76 1/2-81 1/2	76 1/2
Dorman, Long Ord.	1	21 6-16 9	7 1/2	8 1/2	8 1/2-9	8 1/2
Do. Deb.	Stk.	88 1/2-85 1/2	4	87-90	84 1/2-87 1/2	84 1/2
Ebbw Vale Steel & Iron ... Ord.	1	18 1/2-16 1/2	10	10 1/2	7 1/2-8 1/2	7 1/2
Guest, Keen & Ntfields ... Ord.	1	68 9-61 3	15	3 1/2	3 1/2-3 1/2	3 1/2
Do. Cum. pref.	5	5 1/2-5 1/2	5	4 1/2	4 1/2-4 1/2	4 1/2
Do. Deb.	Stk.	100-95 1/2	1	96-98	94 1/2-96 1/2	94 1/2
Hadfield's Steel Foundry ... Ord.	1	63 1/2-58 1/2	22 1/2	3 1/2	3 1/2-3 1/2	3 1/2
Hawthorn (R. & W.) Leslie ... Ord.	10	13-12 1/2	10	13 1/2-13 1/2	13 1/2-13 1/2	13 1/2
Hobson Bros. Ord.	5 (4 pd.)	7-5 1/2	10	6 1/2	6 1/2-6 1/2	6 1/2
Jessop (W.) & Sons Ord.	10	6 1/2-6 1/2	15	1 1/2	1 1/2-1 1/2	1 1/2
Lanarkshire Steel Cum. pref.	10	7 1/2-6 1/2	5	6 1/2	6 1/2-6 1/2	6 1/2
Lysaght (J.) Cum. pref.	1	27 1/2-25	10	1 1/2	1 1/2-1 1/2	1 1/2
Do. Deb.	Stk.	108 1/2-102 1/2	4 1/2	104-106	104-106	104
Manganese Bronze Ord.	1	—	6	11 1/2	1 1/2	—
Do. Cum. pref.	1	1-8 1/2	6	6 1/2	1 1/2	—
North-Eastern Steel Deb.	Stk.	89-92	4 1/2	NH.	NH.	—
Palmer Ship & Iron Ord.	1	16 1/2-14 1/2	5	6 1/2	8 1/2-9 1/2	8 1/2
Scott (Walter) Ord.	1	86-82	4	81-82	89-90	89
Do. Deb.	Stk.	1 1/2-1 1/2	12 1/2	1 1/2-1 1/2	1 1/2-1 1/2	1 1/2
Sheffield Forge Ord.	1	94 1/2-90 1/2	5	93-98xd	94 1/2-98 1/2	94 1/2
Shelton Iron & Steel Deb.	100	35 1/2-23 6	10	6 1/2	1 1/2-1 1/2	1 1/2
S. Durham Steel & Iron ... Ord.	1	20 1/2-19 1/2	6	5 1/2	1 1/2-1 1/2	1 1/2
Do. Cum. pref.	1	90-98	4 1/2	90-92	90 1/2-92 1/2	90 1/2
Do. Deb.	Stk.	12 1/2-8 1/2	5	8 1/2-9	8 1/2-9	8 1/2
Steel Co. of Scotland Ord.	10	21 1/2-20	10	5 1/2	20-21	20 1/2
Stewarts & Lloyds Pref. ord.	10	14 1/2-13 1/2	6	11 1/2-13 1/2	13 1/2-13 1/2	13 1/2
Do. Cum. pref.	10	9 1/2-9	3	8 1/2-9xd	9 1/2-9 1/2	9 1/2
Stone (J.) Cum. pref.	100 1/2	71 1/2-50	5	61-61 1/2	65 1/2-65 1/2	65 1/2
United States Steel Ord.	100 1/2	113 1/2-104 1/2	7 1/2	112-113	115 1/2-115 1/2	115 1/2
Do. Cum. pref.	100 1/2	43-33 1/2	12 1/2	11 1/2-11 1/2	11 1/2-11 1/2	11 1/2
Vickers Ltd. Ord.	1	106 1/2-99	5	104-107	99 1/2-100 1/2	99 1/2
Do. Pref.	Stk.	100 1/2-91 1/2	4	96 1/2-98 1/2	96 1/2-98 1/2	96 1/2
Do. Deb.	Stk.	100 1/2-91 1/2	4	96 1/2-98 1/2	96 1/2-98 1/2	96 1/2
Weardale Steel Def. ord.	1	21-17 1/2	6	7 1/2-8 1/2	7 1/2-8 1/2	7 1/2
Do. Cum. pref.	1	20 1/2-18 1/2	6	18 1/2-19 1/2	18 1/2-19 1/2	18 1/2
Do. Deb.	Stk.	77-73 1/4	4	77-80	77-80	77
Workington Iron & Steel ... Ord.	1	16 6-12 3	6	8 1/2-9 1/2	8 1/2-9 1/2	8 1/2

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Do. ... Cum.	pref.	..	95—41.6	4	5	41 ¹ —41 ¹	..
Do.	Deb.	Stk.	983—94 ¹	5	5	98 ¹ —58	89
Boardman (W.)	Deb.	100	96 ¹ —91 ¹	4 ³	..	94—96	90
Brown John	Ord.	1 (15s. pd.)	23—17.9	12 ³	91	24—13 ¹	..
Do. ... Cum.	pref.	10	19 ¹ —91 ¹	5	5	91—104 ¹	9
Cannell Land	Ord.	5	74—72	7 ²	..	58—43	4
Do. ... Cum.	pref.	5	92 ¹ —79 ¹	5	6	4—44 ¹	..
Do. ... Deb.	100	90 ¹ —84 ¹	4 ³	51	92—94	89	..
Dutton (Jas.)	Ord.	1	18.6—17.6	Nil.	..	13—23	..
Do. ... Cum.	pref.	1	14—8	6	7 ¹	8—1	..
Earned St. pldg.	Can. pref.	10	10—7 ¹	6	8	..	7
Fleming & Ferguson	Ord.	10	24 ¹ —12 ¹	10	6 ¹	14 ¹ —14 ¹	15
Gray Wm	Deb.	100	100 ¹ —100	4 ³	4 ³	100—10	100
Hunter D & W	Cum. pref.	1	3—3	5	12 ¹	1 ¹ —3 ¹	..
Richards Westgarth	Ord.	1	3.6—1.9	Nil.	Nil.	..	..
Do. ... Cum.	pref.	1	9.9—4.5	Nil.	Nil.	..	..
Do. ... Deb.	Stk.	70—58	4 ³	6 ¹	55—58	69	..
Simons (W.)	Cum. pref.	10	10 ¹ —10	5	42	1.1—10 ¹	10
Stephenson R.	Ord.	1	66 ¹ —73	Nil.	Nil.	—	..
Do. ... Deb.	Stk.	66 ¹ —63	Nil.	Nil.	..	—	..
Swan Hunter & W. R.	Cum. pref.	1	19 10 ¹ —16 ¹	10	10 ¹	1 ¹ —1	1
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Do. ... Deb.	Stk.	90 ¹ —88	1 ¹	..	90—63	—	..
Thomson & John L.	Ord.	1	27.6—12.6	8	8	..	..
Do. ... Cum.	pref.	1	19.3—11.3	6	7 ¹	8—1	..
Do. ... Deb.	100	94—91	5	5	88—92	94	..
Wallend Shipway	Ord.	1	1 ¹ —1 ¹	10	..	18—13 ¹	—
Do. ... Cum.	pref.	1	2 ¹ —20	5	..	1—1 ¹	..

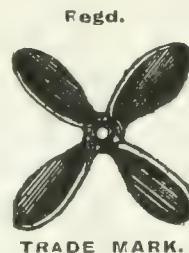


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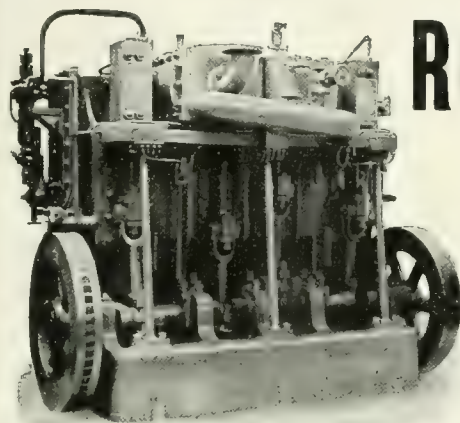
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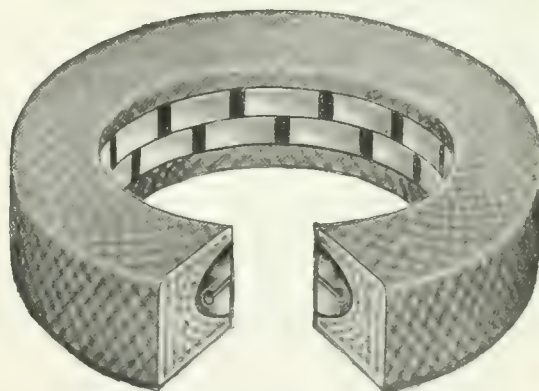
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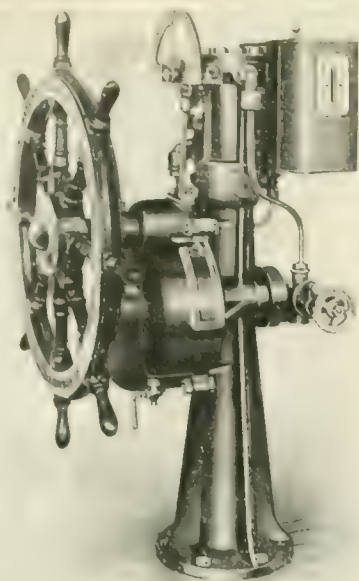
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Boothroyd, H. T., Ltd., Bootle, Liverpool.
British Thomson-Houston Co. Ltd., Rugby.
British Westinghouse Electric & Mfg. Co. Ltd., Trafford Park, Manchester.
Chadburn's (Ship) Telegraph Co. Ltd., Cyprus Road, Bootle, Lancs.
Graham, Alfred, St. Andrew's Works, Crofton Park Road, S.E.
Holmes, J. H., & Co., Portland Road, Newcastle-on-Tyne.
Mather & Platt Ltd., Manchester. [on-Tyne.
Reynolds, A., & Co. Ltd., Hebburn-on-Tyne.
Sunderland Forge & Engineering Co. Ltd., Sunderland.

ELECTRICAL INSTRUMENTS

(Ammeters)
British Thomson-Houston Co. Ltd., Rugby.
British Westinghouse Electric & Mfg. Co. Ltd., Trafford Park, Manchester. [on-Tyne.
Holmes, J. H., & Co., Portland Road, Newcastle-on-Tyne.

ELECTRICAL INSTRUMENTS

(Circuit Breakers)
British Thomson-Houston Co. Ltd., Rugby.
British Westinghouse Electric & Mfg. Co. Ltd., Trafford Park, Manchester. [on-Tyne.
Holmes, J. H., & Co., Portland Road, Newcastle-on-Tyne.
Reynolds, A., & Co. Ltd., Hebburn-on-Tyne.

ELECTRICAL INSTRUMENTS

(Relays)
British Thomson-Houston Co. Ltd., Rugby.
British Westinghouse Electric & Mfg. Co. Ltd., Trafford Park, Manchester. [on-Tyne.
Holmes, J. H., & Co., Portland Road, Newcastle-on-Tyne.
Reynolds, A., & Co. Ltd., Hebburn-on-Tyne.

ELECTRICAL INSTRUMENTS

(Voltmeters)
British Thomson-Houston Co. Ltd., Rugby.
British Westinghouse Electric & Mfg. Co. Ltd., Trafford Park, Manchester. [on-Tyne.
Holmes, J. H., & Co., Portland Road, Newcastle-on-Tyne.

EMERY WHEELS—

Sterne, L., & Co. Ltd., Crown Iron Works, Glasgow

ENAMEL MANUFACTURERS—

Holzapfel, Ltd., Newcastle-on-Tyne.
Willes Dove Bitumastic Ltd., 5, St. Nicholas Buildings, Newcastle-on-Tyne.
Websters Ltd., Hull.

ENGINE (Electric Light)—

Belliss & Morcom, Ltd., Birmingham.
Greenwood & Batley, Ltd., Albion Works, Leeds.

ENGINES (Land)—

Chambers, John, Ltd., Lowestoft.

ENGINES (Marine)—

Allen, W. H., Son & Co. Ltd., Queen's Engineering Works, Bedford.
Central Marine Engine Works, West Hartlepool.
Chambers, John, Ltd., Lowestoft.
Hawthorne, R., & W., Leslie & Co., Ltd., St. Peter's, Newcastle-on-Tyne.
Howden, James, & Co. Ltd., Scotland St., Glasgow.
Perman & Co. Ltd., 82-83, Fenchurch Street, E.C.
White, J. Samuel, & Co. Ltd., East Cowes, I.W.

ENGINE & DECK STORES—

McGeoch, Wm., & Co. Ltd., 28, West Campbell Street, Glasgow.
Metallic Valve Co., Colonial House, Water Street, Liverpool.

ENGINE AUXILIARIES—

Aspinall's Patent Governor Co., 7, Strand Street, Liverpool.

ENGINE FITTINGS—

Aspinall's Patent Governor Co., 7, Strand Street, Liverpool.
McRobie, John, & Sons, 94, Elliott Street, Cranstonhill, Glasgow.

ENGINE-ROOM OUTFITS—

Grieve, T., & Sons, Bedford Street, North Shields.

NEWALLS INSULATION CO., 31, MOSLEY STREET,

ENGRAVERS—

Newcastle-on-Tyne.
Brown, Robert, & Co., 12, Espedair St., Paisley.

EVAPORATORS—

Central Marine Engine Works, West Hartlepool.

Royles Ltd., Irlam, Nr. Manchester.
Weir, G. & J., Ltd., Cathcart, Glasgow.

EXTRUDED METALS (Brass, Bronze, Copper, Delta Metals)—

Delta Metal Co. Ltd., E. Greenwich, London, S.E.

FANS—

Adam, J. M., & Co., Greenfield Iron Works, Dalmarnock, Glasgow.
Allen, W. H., Son & Co. Ltd., Queen's Engineering Works, Bedford.
Boothroyd, H. T., Ltd., Bootle, Liverpool.
British Thomson-Houston Co. Ltd., Rugby.
British Westinghouse Electric & Mfg. Co. Ltd., Trafford Park, Manchester. [Belfast.
Davidson & Co. Ltd., Sirocco Engineering Works, Hogan & Wardrop, 2, Gresham Buildings, Basinghall Street, London, E.C.
Keith, James, & Blackman Co. Ltd., 27, Farringdon Avenue, London, E.C.

FEED-WATER HEATERS—

Beresford Eng'ning Co., Beresford Lane, Cardiff.
Central Marine Engine Works, West Hartlepool.
Central Condenser & Kinetic Air Pump Co. Ltd., 3, Central Buildings, Westminster, S.W.
Royles Ltd., Irlam, Nr. Manchester.
Weir, G. & J., Ltd., Cathcart, Glasgow.

FILES—

Brown, John, & Co., Atlas Works, Sheffield.
Spencer, John, & Sons, Ltd., Newburn-on-Tyne.

FILTERS (Marine)—

Central Marine Engine Works, West Hartlepool.
Chambers, John, Ltd., Lowestoft.
Cockburns Ltd., Cardonald, Nr. Glasgow.
Mather & Platt, Ltd., Manchester.

FIREBARS—

Liverpool Patents Co. Ltd., Derby Square, James Street, Liverpool.

FIRE EXTINGUISHERS—

Low Archibald, & Sons, Ltd., 28, Merkland Street, Partick, Glasgow.
Mather & Platt, Ltd., Manchester.

FIRE-FIGHTING APPLIANCES—

Mining Engineering Co. Ltd., Meco Works, Sheffield.

FLAGS—

Riley, Edward, & Co., Leeds.
Speedings, Ltd., Sail Works, Sunderland.

FLOATING DOCKS—

Chalmers, Wm., & Co. Ltd., Rutherglen, Nr. Glasgow. [Scotland.
Hamilton, Wm., & Co. Ltd., Port Glasgow.
Swan, Hunter, & Wigham Richardson, Ltd., Wallsend-on-Tyne.

FLOOR COVERING—

Docker Bros., Ltd., Metropolitan Road, Saltley, Birmingham.

FORCED DRAUGHT—

Adam, J. M., & Co., Greenfield Iron Works, Dalmarnock, Glasgow. [Belfast.
Davidson & Co. Ltd., Sirocco Engineering Works, Howden, J. & Co. Ltd., Scotland Street, Glasgow.
Keith, James, & Blackman Co. Ltd., 27, Farringdon Avenue, London, E.C.

FORGING PRESSES—

Berry, Henry, & Co. Ltd., Croydon Works, Leeds.
Mactaggart, Scott & Co. Ltd., Loanhead, Edinburgh.

FORGINGS—

Brown, John, & Co. Ltd., Atlas Works, Sheffield.
Darlington Forge Co. Ltd., Darlington.
Hingley & Sons, Ltd., Netherton Iron Works, Staffs.
Sunderland Forge & Engineering Co. Ltd., Sunderland.

FORGINGS (Bronze)—

Delta Metal Co., Delta Works, East Greenwich, London, S.E.

FORGINGS (Steel)—

Brown, John, & Co. Ltd., Atlas Works, Sheffield.
Darlington Forge Co. Ltd., Darlington.
Spencer, John, & Sons, Ltd., Newburn-on-Tyne.

FUMIGATORS—

Low Archibald, & Sons, Ltd., 28, Merkland Street, Partick, Glasgow.

FURNACE BRIDGES—

Hamilton, A., & Sons, 13, Butte Crescent, Docks, Cardiff.

McConwell, A., & Co. Ltd., 60, Drury Buildings, Water Street, Liverpool.

FURNACES—

Brown, John, & Co. Ltd., Atlas Works, Sheffield.
Deighton's Patent Flue & Tube Co. Ltd., Vulcan Works, Pepper Road, Leeds.
Leeds Forge Co. Ltd., Leeds.
Piggott, T., & Co. Ltd., Birmingham.

FUSES—

Reynolds, A., & Co. Ltd., Hebburn-on-Tyne.

GALLEY GEAR—

Grieve, T., & Sons, Bedford Street, North Shields.

GALVANIZERS—

Brady, F., & Co. Ltd., Eclipse Works, Glasgow.

GAS ENGINES—

British Westinghouse Electric & Mfg. Co. Ltd., Trafford Park, Manchester.
Mather & Platt, Ltd., Manchester.

GAUGES—

Chatwin, Thos., Ltd., Gt. Tindal St., Birmingham.

GEAR CUTTING—

Campbells & Hunter, Ltd., Dolphin Foundry, Leeds

GEARING—

Campbells & Hunter, Ltd., Dolphin Foundry, Leeds.

GEARS—

Spencer, John, & Sons, Ltd., Newburn-on-Tyne

GEARS (Noiseless or Silent)—

British Thomson-Houston Co. Ltd., Rugby.
Brown, David, & Sons (Hfd.), Ltd., Huddersfield.

GOVERNORS—

Aspinall's Patent Governor Co., 7, Strand Street, Liverpool.

GRINDING MACHINES—

Greenwood & Batley, Ltd., Albion Works, Leeds.

GRINDING WHEEL MACHINES—

Sterne, L., & Co. Ltd., Crown Iron Works, Glasgow

HATCH COVERS (Patent)—

Hogg-Carr Construction Co. Ltd., Newcastle-on-Tyne.

HEATING APPARATUS—

Ashwell & Nesbit, Ltd., Barkby Lane, Leicester.
Royles Ltd., Irlam, Nr. Manchester.
Saunders & Taylor, Ltd., 43, Lower Mosley Street, Manchester.

HEATING ENGINEERS—

Ashwell & Nesbit, Ltd., Barkby Lane, Leicester.
Low Archibald, & Sons, Ltd., 28, Merkland Street, Partick, Glasgow.
Royles Ltd., Irlam, Nr. Manchester.
Saunders & Taylor, Ltd., 43, Lower Mosley Street, Manchester.

HELM SIGNAL TELEMOTORS—

Mactaggart, Scott & Co. Ltd., Loanhead, Edinburgh

HIGH SPEED DRILLS—

Brown, John, & Co., Atlas Works, Sheffield.

HIGH SPEED STEEL—

Brown, John, & Co., Atlas Works, Sheffield.

HOISTS—

Mather & Platt, Ltd., Manchester.
Stothert & Pitt, Ltd., Bath.
Waygood-Otis, Ltd., Falmouth Road, S.E.

BUYERS' GUIDE—continued.

HOSE—

Heinke, C. E., & Co., 88, 89, Grange Road, Bermondsey, London, S.E.

HYDRAULIC CRANES—

Berry, Henry, & Co., Ltd., Croydon Works, Leeds.
Brown Brothers & Co., Ltd., Rosebank Iron Works, Edinburgh.

Mactaggart, Scott & Co., Ltd., Loanhead, Edinburgh

HYDRAULIC MACHINERY—

Armstrong, Sir W. G., Whitworth & Co., Ltd., Elswick Works, Newcastle-upon-Tyne.
Berry, Henry, & Co., Ltd., Croydon Works, Leeds.
Waygood-Otis, Ltd., Falmouth Road, S.E.

HYDRANTS—

McRobie, John, & Sons, 94, Elliott Street, Cranstonhill, Glasgow.

INDIARUBBER—

Heinke, C. E., & Co., 88, 89, Grange Road, Bermondsey, London, S.E.

INDICATORS—

Robinson, A., & Co., Ltd., Bootle, Liverpool.

INDUCED DRAUGHT—

Davidson & Co., Ltd., Sirocco Eng'g W'ks, Belfast
Keith, James, & Blackman Co., Ltd., 27, Farringdon Avenue, London, E.C.

INSULATIONS—

Jones, Fredk., & Co., Ltd., Perren Street, Kentish Town, N.W.
Liverpool Refrigeration Co., Ltd., Colonial House,

IRON ROOFS AND BUILDINGS—

Braby, F., & Co., Ltd., Eclipse Works, Glasgow.

JOINTING MATERIAL (Manganesite)—

Hudson & Co.'s Successors, John, 15, Victoria Warehouses, Mansell Street, E.C.

LAMPS AND LIGHTS—

Grieve, T., & Sons, Bedford Street, North Shields.
Kaye, Joseph, & Sons, Ltd., Leeds.

LAUNCHES—

Chambers, John, Ltd., Lowestoft.
Crichton, J., & Co., Saltney Shipyard, Chester.
Leitch, John, & Co., The Ferry, Renfrew, Scotland.
Livingstone & Cooper, Ltd., Hesse, Hull.
MacLaren Bros., Ltd., Dumbarton.
Perman & Co., Ltd., 82-83, Fenchurch St., E.C.
Seamless Steel Boat Co., Ltd., Wakefield.
Thornycroft, John I., & Co., Ltd., Caxton House, Westminster, London, S.W.
Watson, J. S., Gainsborough.
White, J. Samuel, & Co., Ltd., East Cowes, I.W.

LAUNDRY MACHINERY—

Bradford, T., & Co., Salford, Manchester.

LAVATORY FITTINGS AND

Levick, John, Alma Street, Aston, Birmingham.

LEAD (Sheets and Pipes)—

Rimer Bros., Newcastle-on-Tyne.

LEAD (White and Red)—

Rimer Bros., Newcastle-on-Tyne.

LIFEBELTS AND BUOYS—

Speedings Ltd., Sail Works, Sunderland.

LIFTS (Window)—

Laycock, W. S., Ltd., Victoria Works, Millhouses, Sheffield.

LIFTS AND HOISTS—

Mactaggart, Scott & Co., Ltd., Loanhead, Edinburgh
Waygood-Otis, Ltd., Falmouth Road, S.E.

LIGHTERAGE—

Alexander, W. H. J., St. John's Wharf, Wapping, E.

LIGHTERS—

Chalmers, Wm., & Co., Ltd., Rutherglen, Nr. Glasgow.
Crichton, J., & Co., Saltney Shipyard, Chester.
Watson, J. S., Gainsborough.

LIMEWASHING & DISINFECTING

MACHINES—
Stonehouse Works Co., Ltd., Houghton Street, West Bromwich.

LOCKS—

Kaye, Joseph, & Sons, Ltd., Leeds.

LOCOMOTIVE TUBES (Copper & Brass)—

The Yorkshire Copper Works, Ltd., Leeds.

LUBRICATORS—

[Cranstonhill, Glasgow.
McRobie, John, & Sons, 94, Elliott Street,

MACHINE TOOLS—

Campbells & Hunter, Ltd., Dolphin Foundry, Leeds.
Greenwood & Batley, Ltd., Albion Works, Leeds.
Scriven & Co., Leeds Old Foundry, Leeds.

MACHINERY NAME PLATES—

Brown, Robert, & Co., 12, Espedair St., Paisley.

MAGNESIA—

Jones, Fredk., & Co., Ltd., Perren Street, Kentish Town, N.W.

MARINE ENGINEERS—

Bailey, C. H., Newport, Mon. [Barry Docks.
Barry Graving Dock & Engineering Co., Ltd.,
Brown, John, & Co., Ltd., Clydebank, Nr. Glasgow.
Chambers, John, Ltd., Lowestoft.
Crichton, C. & H., Ltd., Huskisson Engine Works, Liverpool. [Southampton.
Day, Summers & Co., Ltd., Northam Ironworks, Delegación de la Compañía Trasatlántica, Cadiz.
Diamond, Thos., & Co., Cardiff.
Doxford, Wm., & Sons, Ltd., Sunderland.
Elliot & Jeffery, East Dock, Cardiff.
Gray, Wm., & Co., Ltd., West Hartlepool.
Harland & Wolff, Ltd., Belfast.
Harris Bros., Ltd., Cambrian Dry Docks, Swansea.
Hawthorne, R. & W., Leslie & Co., Ltd., Hebburn-on-Tyne.
Hill's Dry Docks & Engineering Co., Ltd., Cardiff.

MARINE ENGINEERS (contd).—

Isherwood, J. W., 4, Lloyd's Avenue, London, E.C.
Livingstone & Cooper, Ltd., Hesse, Hull.
Mount Stuart Dry Docks, Ltd., Cardiff.
Perman & Co., Ltd., 82-83, Fenchurch St., E.C.
Shearman, John, & Co., Ltd., Cardiff.
Simons, Wm., & Co., Ltd., Renfrew, Nr. Scotland.
Swan, Hunter, & Wigham Richardson, Ltd., Wallsend-on-Tyne. [Westminster, S.W.
Thornycroft, John I., & Co., Ltd., Caxton House, Wallsend Slipway & Engineering Co., Ltd., Wallsend-on-Tyne.
White, J. Samuel, & Co., Ltd., East Cowes, I.W.
Workman Clark & Co., Ltd., Belfast.
Yarrow & Co., Ltd., Glasgow.

MARINE GOVERNORS—

Aspinall's Patent Governor Co., 7, Strand Street, Liverpool
MARKING-OFF TABLES—
Campbells & Hunter, Ltd., Dolphin Foundry, Leeds.

MATTRESSES—

Stewart, Archibald, & Co., 40-48, Union St., Glasgow

METALLIC PACKING—

McConwell, A., & Co., Ltd., 60, Drury Buildings, Water Street, Liverpool.
United States Metallic Packing Co., Ltd., Bradford

METAL SPINNING—

Levick, John, Alma Street, Aston, Birmingham.

METALS (Patent)—

Bowman, Robt., & Co., Ltd., Newcastle-on-Tyne.
Delta Metal Co., Ltd., Delta Works, East Greenwich.

MOTOR BOATS—

Chambers, John, Ltd., Lowestoft.
Crichton, J., & Co., Saltney Shipyard, Chester.
Leitch, John, & Co., The Ferry, Renfrew, Scotland.
Livingstone & Cooper, Ltd., Hesse, Hull.
Perman & Co., Ltd., 82-83, Fenchurch St., E.C.
Seamless Steel Boat Co., Ltd., Wakefield.
Thornycroft, John I., & Co., Ltd., Caxton House, Westminster, London, S.W.
White, J. Samuel, & Co., Ltd., East Cowes, I.W.

MOTOR STARTING AND CONTROL

GEAR—
Holmes, J. H., & Co., Portland Road, Newcastle-Reynolds, A., & Co., Ltd., Hebburn-on-Tyne.

NAVAL ARCHITECTS' SUPPLIES—

Walker, Jas., & Co., 11, Bishop Court, Anderson, Glasgow.

OIL CANS—

Kaye, Joseph, & Sons, Ltd., Leeds.

OIL ECONOMISERS—

Kaye, Joseph, & Sons, Ltd., Leeds.

OIL ENGINES—

British Westinghouse Electric & Mfg. Co., Ltd., Trafford Park, Manchester.
Edina Manufacturing Co., 19b, Broad Wynd, Leith.
Perman & Co., Ltd., 82-83, Fenchurch Street, E.C.
Swan, Hunter, & Wigham Richardson, Ltd., Wallsend-on-Tyne.
Thornycroft, John I., & Co., Ltd., Caxton House, Westminster, S.W.
White, J. Samuel, & Co., Ltd., East Cowes, I.W.

OIL-FUEL INSTALLATION—

Wallsend Slipway & Engineering Co., Ltd., Wallsend-on-Tyne.
White, J. Samuel, & Co., Ltd., East Cowes, I.W.

OIL IMPORTERS & BLENDEES—

Rimer Bros., Newcastle-on-Tyne.

PACKING—

Beldam Packing & Rubber Co., Ltd., 1 and 2, Gracechurch Street, London, E.C.
Walker, Jas. & Co., Ltd., Lion Works, Garford Street, West India Dock Road, E

PAINTS—

Briggs, W., & Sons, Ltd., Dundee.
Cocks, Harry, & Co., Cardiff.
Hamilton, Archd., & Co., Possilpark, Glasgow.
Hoyle, Robson, Barnett, & Co., Ltd., St. Nicholas Chambers, Newcastle-on-Tyne.
Willes Dove Bitumastic Ltd., 5, St. Nicholas Buildings, Newcastle-on-Tyne.
Websters Ltd., Hull.

PANELLINO—

Stewart, Archibald, & Co., 40-48, Union St., Glasgow

PATENT HAWSE PIPE AND DECK

FLANGE—
Hamilton, A., & Sons, 13, Bute Crescent, Docks, Cardiff.

PERFORATED METALS—

Braby F., & Co., Ltd., Eclipse Works, Glasgow.
Piggott, T., & Co., Ltd., Birmingham.

PIPES—

Stewarts & Lloyds, Ltd., 41, Oswald St., Glasgow.
The Yorkshire Copper Works, Ltd., Leeds.

PLANING MACHINES for Plate Edges—

Scriven & Co., Leeds Old Foundry, Leeds.

PLATE BENDING ROLLS—

Scriven & Co., Leeds Old Foundry, Leeds.

PORCELAIN ENAMELLED CAST

IRON—
Levick, John, Alma Street, Aston, Birmingham.

PROPELLERS—

Billington & Newton, Ltd., Longport, Staffs.
Chambers, John, Ltd., Lowestoft. [Liverpool,
Crichton, C. & H., Ltd., Huskisson Engine Works.
Darlington Forge Co., Ltd., Darlington.
Spencer, John, & Sons, Ltd., Newburn-on-Tyne.

PROPELLER BLADES—

Billington & Newton, Ltd., Longport, Staffs.
Darlington Forge Co., Ltd., Darlington.
Stewarts & Lloyds, Ltd., 41, Oswald St., Glasgow.

PUBLICATIONS—

"Shipbuilding and Shipping Record," Quess Anne's Chambers, Westminster, London, S.W.

PULLEY BLOCKS—

Bullivant & Co., Ltd., 72, Mark Lane, London, E.C.
Higginson & Co., 7, Hurst Street, Liverpool.
Loveridge, Ltd., Cardiff.
Wright, Joseph, & Co., Ltd., Tipton, Staffs.

PUMPING ENGINES—

Central Marine Engine Works, West Hartlepool.
PUMPS—
[ing Works, Bedford.
Allen, W. H., Son & Co., Ltd., Queen's Engineer.
Petersford Eng'g Co., Petersford Lane, Cardiff.
Berry, Henry, & Co., Ltd., Croydon Works, Leeds.
Davey & Co. (London), Ltd., 88, West India Dock Road, E.
Dawson & Downie, Elgin Works, Clydebank.
Edina Manufacturing Co., 19b, Broad Wynd, Leith.
Hall, J. P., & Sons, Ltd., Peterborough.
Mather & Platt, Ltd., Manchester.
Weir, G. & J., Ltd., Cathcart, Glasgow.

PUNCHING AND SHEARING

MACHINES—
Scriven & Co., Leeds Old Foundry, Leeds.

RADIATORS—

British Thomson-Houston Co., Ltd., Rugby.
Low, Archibald, & Sons, Ltd., 73, Merkland Street, Partick, Glasgow.
Royles Ltd., Irlam, Nr. Manchester.

RADIATOR TUBES—

The Yorkshire Copper Works, Ltd., Leeds.

BEAMERS—

Chatwin, Thos., Ltd., Gt. Tindal St., Birmingham.

REFRIGERATING MACHINERY

Hall, J. & E., Ltd., Dartford Ironworks, Kent.
Liverpool Refrigeration Co., Ltd., Colonial House, Liverpool.
Stern, L. & Co., Ltd., Crown Iron Works, Glasgow

RESCUE APPLIANCES—

Mining Engineering Co., Ltd., Meco Works, Moorfields, Sheffield.

REVERSING ENGINES (Direct-Acting

Type)—
Brown Brothers & Co., Ltd., Rosebank Iron
Mactaggart, Scott & Co., Ltd., Loanhead, Edinburgh

RHEOSTATS & RESISTANCES (all

kinds)—
British Thomson-Houston Co., Ltd., Rugby.
British Westinghouse Electric & Mfg. Co., Ltd., Trafford Park, Manchester. [on-Tyne.
Holmes, J. H., & Co., Portland Road, Newcastle-Reynolds, A., & Co., Ltd., Hebburn-on-Tyne.

ROPE-CUTTING MACHINES—

Bullivant & Co., Ltd., 72, Mark Lane, London, E.C.

ROPES (Wire)—

Bullivant & Co., Ltd., 72, Mark Lane, London, E.C.

ROUND AND OVAL HOLE CUTTING-

OUT MACHINES—
Campbells & Hunter, Ltd., Dolphin Foundry, Leeds.

RUBBER GOODS—

Heinke, C. E., & Co., 88, 89, Grange Road Bermondsey, London, S.E.

RUBBER HOSE—

Heinke, C. E., & Co., 88, 89, Grange Road Bermondsey, London, S.E.

RUSTLESS IRON—

Braby, F., & Co., Ltd., Eclipse Works, Glasgow

SAFE MANUFACTURERS—

Whitfield's Safe & Door Co., Oxford Street, Birmingham.

SALOON LIGHTS—

Callender's Cable & Construction Co., Ltd., Belvedere, Kent.
Laycock, W. S., Ltd., Victoria Works, Millhouses, Sheffield.

SALVAGE—

Alexander, W. H. J., St. John's Wharf, Wapping, E.

SANITARY FITTINGS AND

APPLIANCES—
Levick, John, Alma Street, Aston, Birmingham.

SCREWING MACHINES—

Chatwin, Thos., Ltd., Gt. Tindal St., Birmingham.

SHAFTING—

Brown, John, & Co., Ltd., Atlas Works, Sheffield.
Darlington Forge Co., Ltd., Darlington.
Spencer, John, & Sons, Ltd., Newburn-on-Tyne

SHAPING MACHINES—

Greenwood & Batley, Ltd., Albion Works, Leeds

SHEAVES -

Higginson & Co., 7, Hurst Street, Liverpool.

SHEERS, TRAVERSING (and and

floating)—
Day, Summers & Co., Ltd., Northam Ironworks, Southampton

SHIP APPLIANCES—

Linklater's Patent Ship Fittings Co., 20, Perry Street, Tynemouth.

SHIP BROKERS—

Hall, Edward, Cardiff.
Pinkney, Thos., & Sons, Sunderland.
Walford, Leopold (London) Ltd., 29, Gt. St. Helens, E.C.

BUYERS' GUIDE—continued.

SHIPBUILDERS—

Brown, John & Co. Ltd., Clydebank, Nr. Glasgow.
 Chambers, Wm., & Co., Ltd., Rutherglen, Nr. Glasgow.
 Chambers, John, Ltd., Lowestoft.
 Cuckton, J., & Co., Saltney Shipyard, Chester.
 Day, Summers & Co., Ltd., Northam Ironworks, Southampton.
 Delegation de la Compagnie Transatlantica, Cadix.
 Dorford, Wm., & Sons, Ltd., Sunderland.
 Gray, Wm., & Co., Ltd., West Hartlepool.
 Hamilton, Wm., & Co., Ltd., Port Glasgow.
 Harland & Wolff, Ltd., Belfast.
 Hawthorne, R. & W., Leslie & Co., Ltd., Hebburn-on-Tyne.
 Hays, Carr & Co., Ltd., Newcastle-on-Tyne.
 Isherwood, J. W., 4, Lloyd's Avenue, London, E.C.
 Livingstone & Cooper, Ltd., Hesse, Hull.
 Simons, Wm., & Co., Ltd., Renfrew, Nr. Scotland.
 Swan, Hunter, & Wigham Richardson, Ltd., Wallsend-on-Tyne. [Westminster, S.W.]
 Thornycroft, John I., & Co., Ltd., Caxton House, Warrington, Cheshire.
 White, J. Samuel, & Co., Ltd., East Cowes, I.W.
 Workman Clark & Co., Ltd., Belfast.
 Yarrow & Co., Ltd., Glasgow.

SHIP CONSTRUCTION—

Brown, John & Co. Ltd., Clydebank, Nr. Glasgow.
 Hays, Carr & Co., Ltd., Newcastle-on-Tyne.

Isherwood, J. W., 4, Lloyd's Avenue, London, E.C.
 Simons, Wm., & Co., Ltd., Renfrew, Nr. Scotland.

SHIP FURNISHINGS & FITTINGS—

Cocks, Harry, & Co., Cardiff.
 Duxey & Co. (Limited), Ltd., 88, West India Dock Road, E.
 Laycock, W. S., Ltd., Victoria Works, Millhouses, Sheffield.
 Linklater's Patent Ship Fittings Co., Hudson Laveridge, Ltd., Cardiff.
 McGeoch, Wm., & Co., Ltd., 28, West Campbell Street, Glasgow. [Liverpool].
 Metallic Valve Co., Colonial House, Water Street, Stewart, Archibald, & Co., 40-48, Union Street, Glasgow.
 Waygood-Otis, Ltd., Falmouth Road, S.E.

SHIP LAVATORIES—

Stewart, Archibald, & Co., 40-48, Union St., Glasgow

SHIP PLATES (Steel)—

Spencer, John, & Sons, Ltd., Newburn-on-Tyne.
 Stewarts & Lloyds, Ltd., 41, Oswald St., Glasgow.

SHIP REPAIRERS—

Bailey, C. H., Newport, Mon.
 Crichton, C. & H., Ltd., Huskisson Engine Works, Liverpool. [Southampton].
 Day, Summers & Co., Ltd., Northam Ironworks, Diamond, Thos., & Co., Cardiff.
 Dorford, Wm., & Sons, Ltd., Sunderland.
 Elliot & Jeffery, East Docks, Cardiff.
 Gray, Wm., & Co., Ltd., West Hartlepool.
 Grayson, H. & Co., Ltd., Royal Liver Building, Liverpool.
 Harland & Wolff, Ltd., Belfast.
 Harris Bros., Ltd., Cambrian Dry Docks, Swansea.
 Hawthorne, R. & W., Leslie & Co., Ltd., Hebburn-on-Tyne.
 Hill's Dry Docks & Engineering Co., Ltd., Cardiff.
 Mount Stuart Dry Docks, Ltd., Cardiff.
 Shearman, John, & Co., Ltd., Cardiff.
 Swan, Hunter, & Wigham Richardson, Ltd., Wallsend-on-Tyne.
 Wallsend Slipway & Engineering Co., Ltd., Wallsend-on-Tyne.
 Yarrow & Co., Ltd., Glasgow.

SHIPS' ELECTRIC FITTINGS—

McGeoch, Wm., & Co., Ltd., 28, West Campbell Street, Glasgow.
 Reyrolle, A. & Co., Ltd., Hebburn-on-Tyne.
 Sunderland Forge & Engineering Co., Ltd., Sunderland.

SHIPS' LAUNDRIES—

Bradford, T., & Co., Salford, Manchester.

SHIPS' TELEGRAPHS—

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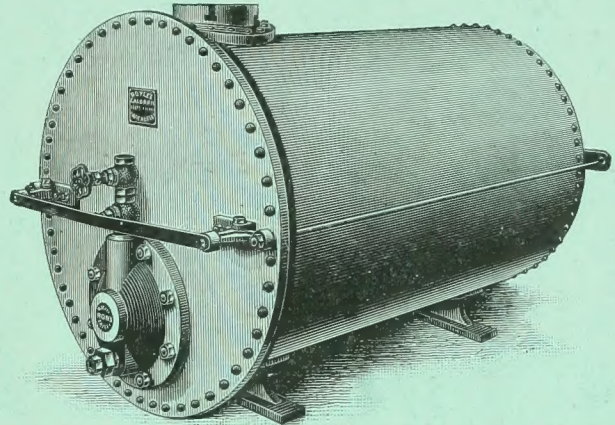
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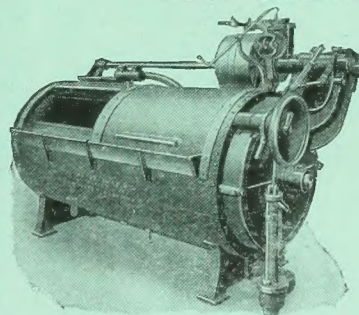
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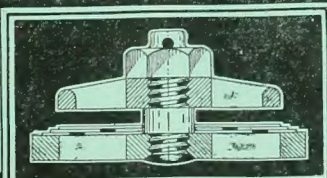
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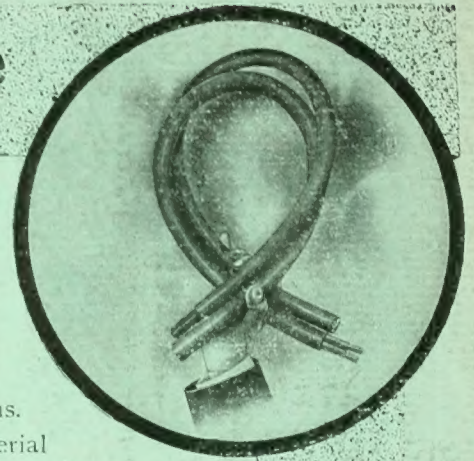
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